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The late LORD KENYON, K.C.V.O.

MEMOIR OF THE LATE LORD KENYON, K.C.V.O.

THE late Lord Kenyon, who died on November 29th, 1927, after four months' illness, was one of the prime movers in extending a cordial invitation to the International Dairy Congress to hold its 1928 meetings in Great Britain.

Lord Kenyon, who at his death was 63 years of age, was the fourth Baron, being the only son of the Hon. Lloyd Kenyon, eldest son of Lloyd, third Baron Kenyon. His mother being the Hon. Fanny Mary Katherine Ormsby-Gore, only child of the first Baron Harlech, thus he represented in his own person two of the most illustrious families in that part of the country. His father having died in April, 1865, Lord Kenyon succeeded his grandfather as fourth baron on July 14th, 1869. The family residences are Gredington, Whitchurch, Salop; Peel Hall, Bolton, Lancashire; Boreham House, Chelmsford; and a town residence in The Albany, Piccadilly, W.

The first Lord Kenyon was a famous judge, and, among other appointments, held that of Chief Justice of Chester in 1780. Afterwards he became Attorney-General, Master of the Rolls, and Lord Chief Justice of England. He was created a baronet in 1784 and Lord Kenyon, Baron of Gredington, Co. Flint (peerage of Great Britain) in 1788. Lord Tyrell-Kenyon, 4th Baron of Gredington, whose death we are mourning, was only five years of age, when he succeeded to the title. He was educated at Eton and Christ Church, Oxford. As becomes a county landowner, he joined the Shropshire Yeomanry and ultimately became Colonel-Commanding and Hon. Colonel of the Regiment. He earned the Territorial Decoration. In 1914 he was appointed superintendent of a Remount depot, work for which his lordship was eminently fitted by reason of his life-long experience with horses both in the Yeomanry and in the hunting field. From December, 1914, to December, 1916, he was Colonel-Commanding the 2/1 Welsh Horse. His lordship was of commanding stature, and at one time he was the tallest peer.

He was well-known at Court, having had the honour of serving as Lord-in-Waiting to H.M. Queen Victoria, and H.M. King Edward VII (1900-1905) and to H.M. King George V (1916-18). In 1907 he received the appointment to the dignity of K.C.V.O.

He was an A.D.C. to the King, and a Knight of Grace of St. John, and his honours included the Grand Cross of Danneborg of Denmark and the Crown of Italy.

Soon after he attained his majority, Lord Kenyon began to take an active share in the public life of Flintshire, Shropshire and neighbouring counties. He served on the Flintshire County Council and became Chairman of that body. He was Lord Lieutenant of Denbighshire, a Justice of the Peace for both Flint and Salop, and a Deputy-Lieutenant for the latter county. Welsh education and non-political Welsh national movements always commanded his most active sympathies, and the honour which the Governors of the University College of North Wales conferred upon him, by unanimously electing him President of that body, was one which was thoroughly well deserved, as was also his appointment as Pro-Chancellor of the University of Wales. He was a member of the Welsh Land Commission and President of the National Museum of Wales.

In 1924 he accepted an invitation to America and attended the celebration of the centennial of Kenyon College, Ohio, founded largely through the instrumentality of his great grandfather. Lord Kenyon was accompanied on this trip by two other members of the family, and they had a great welcome, being received by President Coolidge among others.

Lord Kenyon was first chosen as President of the British Dairy Farmers' Association in 1907, and remained a Vice-President until 1927, when steps were taken to extend a cordial invitation to the International Dairy Congress to hold its sessions in the United Kingdom during 1928.

Obviously, a man commanding the confidence of all sections of the dairy industry, with great business ability and of outstanding position, was required to lead the Association through the two difficult years of preparation and fructification of this high enterprise, so the Council of the B.D.F.A. had no hesitation in asking Lord Kenyon to serve again as their President through 1927 and 1928. He was also Chairman of the Committee specially charged with making all arrangements for the visit of the International Dairy Congress—in both positions he gave great and unstinted service and in so doing, possibly overtaxed his strength. Many times the members of the Council of the B.D.F.A. were surprised by the happy and thorough way in which he dispatched their business in shorter time than was usually the case, and the better he was known, the more he was respected and even loved.

The owner of a large agricultural estate, comprising large farms and many small holdings, he took a very real personal interest in his tenants and regarded them as his friends, a feeling which was heartily reciprocated—his estate being administered according to the highest traditions of the best landowners. No occupier on the Gredington

Estates was ever disturbed, and the widow, or son, or daughter of a tenant who had died, always had a first claim on the farm, many stories being extant of the consideration which was invariably shown to them under such circumstances. The respect and affection thus created found a response at the funeral at Hanmer, when some of the humbler tenants travelled miles on foot to pay their last tribute to their dead landlord.

Lord Kenyon, as President of the Whitchurch Dairy Farmers' Association, took a keen interest in the Cheshire Cheese industry, which he rightly regarded as the foundation of any prosperity which was possible for the dairy farmers in the wide area comprising Cheshire, Shropshire and North Wales, and when the scheme for grading Cheshire Cheese was inaugurated, he welcomed it, and showed a practical interest in its objects by offering special prizes for open competition by those who joined the Federation of registered makers.

Further evidence of the universal trust and respect in which he was held was shown by the fact that he proved a most acceptable Chairman of the Central Wages Board of England and Wales.

Lord Kenyon's death leaves the whole world poorer, and it will be impossible to fill his place. He lived a life of service to others and his personal qualities made him well-beloved more especially in his own home but also in the many wider spheres in which he served.

MILK: THE ECONOMICS OF ITS PRODUCTION AND DISPOSAL.

By ARTHUR G. RUSTON, D.Sc.,

Lecturer in Agricultural Economics, the University of Leeds.

IMPORTANCE OF THE DAIRY HERD.

THE economic value of the dairy herd to the agriculturist in this country is brought out by a study of the Agricultural Output of England and Wales, which has been recently published by the Ministry, in which it is shown that the output of milk and dairy produce from holdings in England and Wales in 1925 had an estimated value of £57,600,000, and was far and away the most valuable of our agricultural products, forming—

37 per cent. of the output of stock products,
25 per cent. of the total output,

and being—

1 $\frac{1}{4}$	times the value of the whole of the output of crop products.
1 $\frac{3}{4}$	" " " " beef.
2 $\frac{1}{4}$	" " " " pork.
3	" " " " mutton.
5 $\frac{1}{2}$	" " " " poultry.
4 $\frac{1}{2}$	" " " " wheat.
5	" " " " potatoes.
8	" " " " barley.

Its importance in the internal economy of the farm is brought out clearly by a study of the records for the last six years taken on the farms whose accounts we have had under investigation during that time (Table I).

On the whole of the farms under observation, not only has there been nothing left for the farmer to meet his claim for management charges, but, after investing capital to the extent of £13 Os. 1d. per

acre in the farm for six years free of interest, he has been forced to draw on his reserves still further and contribute an additional sum, the equivalent of 10d. an acre each year, to meet the deficiencies of the farm.

TABLE I.
AVERAGE FINANCIAL RESULTS OF ALL FARMS.

Year.	No. of farms.	Acres.	Profit.	Loss.
			£	£
1921-22	38	9,310	—	15,385
1922-23	55	16,377	—	24,995
1923-24	70	20,148	9,503	—
1924-25	88	24,680	13,076	—
1925-26	81	23,707	6,750	—
1926-27	57	18,171	6,873	—
Gross ...	—	112,393	£36,202	£40,380
Net ...	—	—	—	£4,178

On the other hand, the dairy herds have as a whole paid their way right through, and during the period in which the whole of the farms have shown a total deficit of £4,178, the dairy herds on these very farms have shown a total profit of no less than £33,079, corresponding to one of £7 17s. 7d. per head per year.

While Table I gives the average profit or loss obtained in the six consecutive years on the whole of the farms under investigation, it does not by any means tell the whole of the story, for very widely varying economic results have been obtained in each year from the different individual farms.

Right through, even in the worst days of the slump, there have always been men in the farming industry who have been making money. In order to see what type of men these have been we have each year arranged the farms under observation in order of the net returns left on the capital invested, and placed in our list of most successful farms, the first 15 or 16 per cent. When we examine the records of these, we find that the men who have been making money have been those who, as far as stock are concerned, have been concentrating largely on milk production, the only sheltered section of the agricultural industry, and at the same time not forgetting the value of pigs and poultry when quick sales and rapid turnover, and minimum initial capital outlay are required.

During the six years, the total profit made on these successful farms, amounted to £61,632 or £3 19s. 6d. per acre. On these successful holdings:—

The cows left a total profit of	...	...	...	£23,662
The poultry „ „ „	...	...	...	4,661
The pigs „ „ „	...	...	...	4,285
The sheep „ „ „	...	...	...	3,072
The cattle left a total loss of	...	...	...	4,361

so that the stock were responsible for £31,319
or 51 per cent. of the total profit made. Of the £30,312 profit made
by the crops on these farms:—

Potatoes contributed	...	...	...	...	£12,955
Barley contributed	...	...	...	...	5,359
Hay contributed	...	...	...	...	2,793
Wheat contributed	...	...	...	...	2,238
Oats contributed	...	...	...	...	1,978
Carrots contributed	...	...	...	...	1,279
Peas picked green contributed	...	...	...	...	1,077
Sugar beet contributed	...	...	...	...	1,026
Sundry other crops the balance of	...	...	...	...	1,607
Profit made by all crops	...	...	...	...	<u>£30,312</u>

The outstanding importance of the dairy herd as an economic factor of financial success in present day British agriculture is self evident.

YORKSHIRE RECORDS.

In discussing the problem of the production and disposal of milk, I should like to deal mainly with some of our Yorkshire records, which date back continuously to 1908, since they show the varied economic returns which have been obtained in different periods on the same holdings, due partly to changing economic conditions in the agricultural situation, and partly to modifications which have in some cases been made by individual milk producers to modify their systems of management to meet those changing conditions. These records also show variations in the economic returns obtained during the same period in different holdings, according to their varying geographical positions, and the varying methods, more or less under control, which have been adopted on the farms in both the production and disposal of their milk.

TABLE II.

Cow Account 1923-24.

No. of cows	664						
No. of farms (Yorkshire farms specialising in milk production)	31						
TOTAL MILK YIELD	374,302	gals.					
Average milk yield	582	"					
<i>Initial Valuation—</i>	£	s.	d.	<i>Final Valuation—</i>	£	s.	d.
671 Cows	18,622	6	6	680 Cows	18,794	10	0
<i>Purchased—</i>				<i>Sales—</i>			
317 Cows	9,051	3	3	324 Cows	7,222	1	3
16 Home-bred				Value of 174 calves	334	8	0
heifers transferred	320	0	0	Manurial value of foods			
Grazing—945 acres	2,157	3	2	consumed	1,727	17	9
Forage—51 acres	781	2	8	Cost of production of			
	T. C.			374,302 gallons	22,559	10	8
Hay	708	0	2,208	16	6		
Straw	580	0	807	11	1		
Roots	2,997	0	2,758	19	10		
<i>Concentrated foods—</i>							
Cakes	432	0	3,933	9	10		
Meals	162	10	1,523	18	7		
Homegrown corn	73	5	709	2	0		
Sundries			1,861	12	9		
Labour			5,903	1	6		
			£50,638	7	8		
					£50,638	7	8

A study of our records reveals the fact that, taken as a whole, milk cows have left each year a good financial return. This is especially the case when the produce is sold off the farm in the form of liquid milk, the actual net returns being, as far as we have seen, determined more by *marketing conditions* than *production costs*.

Table II gives a summary of the cost of milk production in 1923-24 on some 31 Yorkshire farms which included 644 dairy cows, and conveys a good deal of information as to the general system of management adopted in the county. It will be seen that the milk yield of the cows has not been particularly high, averaging in all the herds 582 gallons per cow; that apparently the cows are being kept on the average for two lactations only, 333 new cows being brought into the herds during the year, of which only 16 were home-bred heifers. Evidently in the milk producing herds very little breeding is done.

It will also be seen that the 317 cows were bought in for £9,051 3s. 3d., or an average of £28 11s. 6d. per head, and that 324 cows were disposed of during the year for £7,222 1s. 3d., or an average of £22 5s. 6d., there being an average difference of £6 10s. between the buying in price of the calving or newly calved cows and the selling out price of the cows at the end of their lactation periods, these cows going mainly, if we may judge from the price realised, as beef.

One striking fact comes out; that from the 671 cows in the herd at the beginning of the financial year, the 317 cows bought in and the 16 home-bred heifers transferred into the herds during the session,

only 174 calves were dropped alive. Evidently abortion must be pretty rife, for this would allow for only one-half of the cows calving normally even if the whole of the cows bought in had already calved. The records show quite clearly that the milk producers in the county as a class prefer to buy in *newly calved cows* and allow others to take the calving risks; calves apparently being of little value to them. From this Table it will be seen that 373,302 gallons of milk were produced at a cost of £22,559 10s. 8d., corresponding to an average cost of 1s. 2½d. per gallon. Expressing the same result in another form as in Table III, a good deal more useful information can be obtained.

TABLE III.
COST OF MILK PRODUCTION 1923-24.

	Total.	Per head per year.	Per gallon of milk.	Per cent.
	£ s. d.	£ s. d.	£ s. d.	
Grazing	2,157 3 2	3 7 0	0 0 1½	9·6
Forage crops	781 2 8	1 4 3	0 0 0½	3·5
Hay	2,208 16 6	3 8 5	0 0 1½	9·8
Straw	807 11 1	1 5 1	0 0 0½	3·6
Roots	2,758 19 10	4 5 8	0 0 1½	12·3
Concentrates	6,166 10 5	9 11 9	0 0 4	27·6
TOTAL FOOD	14,880 3 8	23 2 2	0 0 9¾	66·4
Depreciation	1,976 18 6	3 1 2	0 0 1¼	8·5
Sundries	1,861 12 9	2 17 10	0 0 1¼	8·3
Labour	5,903 1 6	9 3 4	0 0 3¾	26·0
GROSS COST	24,621 16 5	38 4 6	0 1 4	109·2
Less manure	1,727 17 9	2 13 9	0 0 1¼	7·7
Less calves... ..	334 8 0	0 10 5	0 0 0½	1·5
NET COST	22,559 10 8	35 0 4	0 1 2½	100·0%

From Table III it will be seen that the average yearly cost of keeping a cow amounted to £35 0s. 4d. or 13s. 6d. per week; of the total cost the food bill amounted to no less than £23 2s. 2d., or more than 66 per cent.; the labour bill to £9 3s. 4d., or 26 per cent.; the depreciation of the cows to £3 1s. 2d., or 8½ per cent.; while the manurial value of the foods consumed and the value of the calves dropped did little more than compensate for the various incidental and sundry expenses.

With the food bill more than two-thirds of the total cost of the milk, it is obvious that it is in this direction that most attention must be paid if economies in milk production are to be effected.

FOOD CONSUMPTION.

Some of the details which are contained in Table II have been extracted and epitomised in Table IV. They reveal the facts that during the year each cow, on an average, had the grazing of approximately $1\frac{1}{2}$ acres of pasture, and in addition consumed roughly 2 tons of hay and straw, $4\frac{1}{2}$ tons of roots and 1 ton of concentrated foods. This would mean that each cow, if fed entirely on home produced foods, would consume the produce of at least $3\frac{1}{2}$ and probably 4 acres.

TABLE IV.
FOOD CONSUMPTION 1923-24.

	Total Food.	Per head per year.	Acres.
Grazing	945 acres	1.47 acres	1.47
Forage crops	51 acres	0.08 acres	0.08
Hay	708 tons	21 cwts.	1.00
Straw	580 tons	18 cwts.	1.00
Concentrates	668 tons	20 cwts.	
Roots	2,997 tons	92 cwts.	0.25
	—	—	3.80

DISPOSAL OF MILK.

From Table V it will be seen that the total sales of the 374,302 gallons produced in 1923-24 by 644 cows amounted to £27,214 8s. 5d., corresponding to £42 4s. 10d. per cow, or 1s. $5\frac{1}{4}$ d. per gallon of milk; and in fact the total profit made by the cows amounted to £4,654 17s. 9d. corresponding to £7 4s. 6d. per cow per year, or $2\frac{3}{4}$ d. per gallon of milk produced.

TABLE V.

Milk and Dairy Produce.	Yorkshire— 31 Farms.		Great Britain.	
	Estimated value.	Per cent.	Estimated value.	Per cent.
Liquid milk—	£		£	
Wholesale	20,937	77% } 95 18% } 1½% } 1½% }	48,700,000	85%
Retail	4,997			
Household	369			
Calves	377			
Butter	419	2% }	5,780,000	10%
Cheese	17	—	2,740,000	4%
Cream	67	—	320,000	1%
Skimmed milk	28	—	60,000	
TOTAL	£27,211	100%	£57,600,000	100%

It will also be seen that of the returns :—

77 per cent. has come from the sales of liquid milk sold wholesale.

18 per cent has come from the sales of liquid milk sold retail.

2 per cent. has come from the sales of milk products mainly in the form of butter.

1½ per cent. has come from the milk fed to calves.

And 1½ per cent has come from the milk used in the household or given to the men.

This method of the disposal of the milk has, until quite recently, remained right through on fairly constant lines.

How far this method of disposal is common to other parts of the country can be gauged from the Ministry's estimate of the value of the milk and dairy produce sold off the farms or consumed in farm households in the year 1925. There are certainly suggestions that in Yorkshire a larger proportion than usual, perhaps 10 per cent., of the milk produced is sold in liquid form. How far that is due to the size of the consuming market and the demands of the teeming population in the industrial area of the West Riding and the Cleveland area of the north, we may at least hazard a guess.

LIQUID MILK.

To what extent the milk producers in Yorkshire are wise in their selection of their methods of disposal of their milk, a study of the "Blue Books" will show. In 1925 the total value of the imports of milk products which come into direct competition with liquid milk amounted to £6,278,426, made up as follows :—

TABLE VI.
IMPORTS IN 1925.

	Quantity.	Value in £.
	Cwts.	£
Fresh milk	50,448	32,540
Milk powder	137,488	406,755
Condensed whole milk not sweetened	355,962	1,026,344
Condensed whole milk sweetened...	289,543	852,859
Condensed skimmed milk sweetened	1,596,129	3,208,583
Preserved milk of other kinds ...	34,194	261,831
Cream	88,854	489,514
	2,552,652	£6,278,426

In view of the fact that the home production of milk amounts to about £50,000,000, it is clear that as far as this branch of agriculture is concerned about 89 per cent. of our milk is produced at home and about 11 per cent. is imported.

In 1913 we were spending £2,500,000 on imported milk products of this character; during the War, however, the consumption of condensed milk increased rapidly, until in 1919 the value of these products reached well over £17,000,000. From that time there has been a steady drop as is shown by the following figures:—

£13,155,172	imported in 1920.
£11,447,769	„ „ 1921.
£7,042,531	„ „ 1923.
£4,832,612	„ „ 1926.

It is unfortunate that there is a steady and persistent growth in the imports of condensed, sweetened, *skimmed* milk, which, on account of its relative cheapness, will undoubtedly be fed to children in the poorer districts. The increasing consumption of this milk, with its badly balanced nutrient ingredients, must be a contributing factor in the production of deficiency diseases like rickets among children in our towns.

In spite, however, of the recent increase in the sales of condensed separated milk, the price of liquid milk in the home market is determined by the home supply, and the price at which it should be sold both wholesale and retail could be fixed by the men who are producing it, if they only realised the strategic strength of their position; and the spirit of loyalty were more strongly developed.

BUTTER.

On the other hand if the milk producer is disposing of his milk in the form of butter or cheese the price that he will have to accept will be influenced, and influenced largely, by foreign competition. In 1925 butter to the value of £53,204,417 was imported, and only a quantity equivalent to £5,780,000 was produced for sale within the country, in other words the home produced butter formed less than 10 per cent. of our total supply.

Liquid milk must be fresh, with the result that no overseas supply reaches us, except an almost negligible quantity which comes from Ireland. Butter will keep, with the result that large supplies reach us, not only from Denmark, but also from New Zealand and Australia. In 1925 5,853,245 cwts. of butter were imported, the average price of which amounted to £9 1s. 10d. per cwt., or 1s. 7½d. per lb., corresponding approximately to 8d. per gallon of milk used in its production. If we wish to compete in the open market for the butter trade, we must either be prepared to place upon that market a better sample than either Denmark or New Zealand; or be prepared to accept the price that these countries are willing to take. While possibly the milk producers in New Zealand, where the cows can be out at grass the

whole year round, may be able to dispose of their milk at 8d. per gallon in the form of butter and more than hold their own; and while possibly the milk producer in Denmark, where there are practically no restrictions of hours, and most of the labour employed is family labour, may, on account of the slightly higher price obtained for a distinctly better product, again be able to dispose of butter at a profit, there is no doubt that it must be exceedingly difficult to make butter-making an economic proposition in this country except in those districts in which milk can be produced most cheaply.

CHEESE.

In 1925 3,098,702 cwt. of cheese to the value of £15,696,800 were imported into this country, with the result that the home produced cheese formed only 15 per cent. of the total supply. Presumably again the price of English cheese in the home market, with the possible exception of certain high grade cheese for which there is a limited demand, will be determined by world prices, and as imported cheese came into this country in 1925 at an average price of £5 1s. 4d. per cwt., or 9d. per lb., British milk producers competing in the ordinary cheese market must be prepared to dispose of their milk at a price equivalent to only 9d. per gallon, cheese should prove a stronger line of defence than butter upon which to rely for the disposal of surplus milk; but the man who puts his trust almost entirely in the cheese market, must not expect high economic returns from his dairy herd.

YEARLY VARIATIONS IN ECONOMIC RETURNS FROM MILK PRODUCTION.

From the Tables VII and VIII, it will be seen that the yearly cost of upkeep of the cow, which as far as records show was less than £30 before the War, reached its maximum in 1920-21, when it was more than doubled. Since then there has been a decided tendency for that cost to fall, while to-day it stands at between 30 and 40 per cent. above the pre-War level, the interesting thing to me being that in the last two years the cost curve has again had a tendency to go upwards, the tendency being most marked in the costs of labour, sundries, hay and concentrates. On the other hand, in spite of the tendency of costs to increase during these two years, there has been a marked increase in the milk yields; while in spite of the generally falling prices, there have been signs of increase in the selling price of milk per gallon, and undoubted increase in the gross return from the sale of milk; so much so, that the margin of profit has undoubtedly tended to rise.

The records show signs of—

- (a) Better treatment of grassland, with its corresponding increasing stock-carrying capacity.
- (b) Heavier feeding of hay and concentrates.
- (c) Less extravagant feeding of roots.

TABLE VII.—AVERAGE YEARLY VARIATIONS IN COST OF UPKEEP PER COW.

Year ...	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.
No. of cows ...	405	269	389	463	644	890	672	487
No. of herds ...	10	11	18	23	25	28	28	16
COST OF UPKEEP PER COW.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Grazing and forages ...	4 12 6	7 19 0	8 10 2	6 18 10	4 11 3	5 0 5	5 6 11	4 17 8
Hay and straw ...	6 13 10	6 2 9	5 12 10	4 13 9	4 13 6	3 13 3	5 6 11	5 0 1
Roots ...	6 17 1	5 2 3	5 6 1	4 6 11	4 5 8	3 11 10	4 4 4	3 4 6
Concentrates ...	23 13 4	23 1 7	15 10 11	12 10 10	9 11 9	11 12 4	15 2 11	13 10 7
TOTAL FOOD ...	41 16 9	42 5 7	35 0 0	28 10 4	23 2 2	23 17 10	30 1 1	26 12 10
Depreciation ...	3 6 4	8 18 5	11 14 10	9 11 4	3 1 2	0 14 8	1 18 7	2 3 0
Sundries ...	4 2 9	3 9 10	1 10 3	0 15 10	2 17 10	5 4 9	3 1 1	4 17 8
Labour ...	11 10 8	16 14 10	13 11 0	11 2 11	9 3 4	9 10 8	9 8 0	11 10 0
Gross Cost ...	60 16 6	71 8 8	61 16 1	50 0 5	38 4 8	39 7 11	44 8 9	45 3 6
Less manure ...	4 1 7	5 8 7	4 4 3	3 3 6	2 13 9	2 10 7	3 9 2	3 5 5
Less calves ...	2 6 9	1 7 2	1 0 1	0 19 6	0 10 5	0 4 5	0 16 1	0 10 9
NET COST ...	54 8 2	64 12 11	56 11 9	45 17 5	35 0 4	36 12 11	40 3 6	41 7 4

TABLE VIII.—AVERAGE YEARLY VARIATIONS IN ECONOMIC RETURNS FOR MILK PRODUCTION.

Year ...	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.
Average milk yield ...	galls. 560 £ s. d. 0 2 1½	galls. 593 £ s. d. 0 2 2	galls. 590 £ s. d. 0 1 11½	galls. 588 £ s. d. 0 1 6½	galls. 582 £ s. d. 0 1 2½	galls. 542 £ s. d. 0 1 4½	galls. 615½ £ s. d. 0 1 4	galls. 652 £ s. d. 0 1 4
Average cost of production per gallon ...	...	...	...	...	...	...	...	...
Average selling price per gallon ...	0 2 5½	0 2 8½	0 2 0½	0 1 5½	0 1 5½	0 1 6½	0 1 6½	0 1 8
Average sales per cow ...	63 19 6	79 19 3	62 0 6	48 14 8	42 4 10	43 13 3	47 0 5	54 3 9
Average profit per cow ...	9 11 4	15 6 4	5 8 9	2 17 3	7 4 6	7 0 4	6 17 3	12 16 5
Average profit per cow per week ...	0 3 8	0 5 10½	0 2 1	0 1 4½	0 2 9	0 2 8½	0 2 7½	0 4 11
Average profit per gallon ...	0 0 4	0 0 6½	0 0 1	0 0 1½	0 0 2½	0 0 2½	0 0 2½	0 0 4
FOOD CONSUMPTION PER HEAD.								
Grazing ...	acres. 1.48	acres. 1.7	acres. 1.3	acres. 1.6	acres. 1.47	acres. 1.6	acres. 1.5	acres. 1.32
Forage crops ...	—	0.09	0.1	0.03	0.08	0.3	0.07	0.08
Hay ...	18.0	17.6	18.0	31.9	21.0	35.9	24.0	23.0
Straw ...	12.0	10.0	16.0	18.0	18.0	16.0	16.0	11.0
Roots ...	82.0	62.3	78.0	70.0	92.0	75.0	67.0	33.0
Concentrates ...	26.0	26.6	19.0	22.1	20.0	23.4	30.0	38.0

- (d) Increasing milk yields.
- (e) Selling prices per gallon falling sharply after 1920 for two years, then showing a steady tendency, and afterwards quite a marked recovery; the hardening of prices being due to alterations in the methods of disposal, rather than to rising wholesale or retail prices of milk of the same grade. The recent upward tendency of the costs of labour and sundries is also due to the same alterations in the methods of disposal.

During the War many of the outlying districts, particularly in the Dales, which previously had been concentrating on the rearing of stock and butter or cheese production, switched over and got rid of their milk wholesale in liquid form, motor transport opening up many a district which previously was almost inaccessible.

The effect of this alteration in the method of disposal of the milk has been made manifest by the shortage of store cattle, while the economic advantage originally obtained in the War days of milk shortage, has since been undoubtedly minimised by the low prices received in these areas for the liquid milk, practically the whole of which is sold wholesale.

During the past few years, many of the more progressive milk producers, realising that too big a share of the price paid by the consuming public has been taken by the distributor, have undertaken their own distribution, and made efforts to supply the public with the clean, graded and higher quality milk, for which there is an undoubted demand, and which the consumer is prepared to take at a slightly advanced figure.

THE VARIATIONS IN THE ECONOMIC RETURNS FROM MILK IN DIFFERENT HERDS IN THE SAME YEAR.

While the records given refer to the average results obtained in the whole of the herds under observation, yet in each year very different economic results have been obtained in the different herds under different systems of management, situated in different districts, and with different marketing facilities.

The economic returns obtainable from the sales of milk must be determined by at least three factors:—

- (a) The cost of upkeep of the cows.
- (b) The milk yield of the cows. These two determine the cost of milk production.
- (c) The method of disposal of the milk which in many cases has been found to be of even more importance than its cost of production.

The records of the year 1926-27 of eight different herds are shown in Table IX, they are arranged in descending order of the value of the milk sales, and are well worthy of study, for they bring out quite clearly that success in milk production is determined by no one single factor, but by a combination of many.

HIGH MILK YIELD is important for success, but financial success is not necessarily proportionate to the milk yield.

Herd "E" has an average milk yield of 771 gallons, and an average margin of profit of £10 11s. 5d. per cow, or 22 per cent. of the production costs.

Herd "G" has an average yield of 501 gallons per cow, and an average margin of profit of £16 9s. 2½d. per cow, or 72 per cent. of the production costs.

HIGH SELLING PRICE OF MILK per gallon is important for success, but again does not command it.

In Herd "C" the milk was last year disposed of at an average of 2s. 3½d. per gallon, and made a profit of £4 19s. 1d. per cow, or of 8½ per cent. on the production costs.

In Herd "A" the milk was sold at 1s. 8d. per gallon, and left a profit of £28 7s. 7d. per cow, or 63 per cent. of the production costs.

A combination of high yields and high selling prices should give a high gross monetary return, but even this combination, desirable as it is, is not all sufficient, as the high returns may be obtained, as they have been in the case of Herd "C" at too high a production cost.

A high gross monetary return from the milk, and a low cost of upkeep of the cows, give a high margin of profit, surely the beau ideal of the milk producer.

Herd "D" last year had the highest margin of profit, £30 9s. 8d. per cow, or 97 per cent. of the production costs, yet as a business proposition, I should hesitate to invest money in it, and in my own mind have grave doubts as to the ultimate financial success of this man as a milk producer.

Herd "A" last year had the highest average milk yield, the highest gross returns, but on account of his geographical position his sales of milk are incapable of expansion. The sales of "D" are likely to fall, those of "A" to remain stationary, and the real success of the latter will in all probability depend upon keeping his output of milk where it is, and developing the poultry industry. On the other hand, the sales from Herd "D" because he is not giving to his customers the article they should be getting at the price they are paying, are likely to fall rather than to rise, and his phenomenal success this year likely to prove a flash in the pan.

"B" is, to my mind, the most successful milk producer. His milk yield, though not exceptional, is still high, his cost of production low, particularly when it is remembered that this cost includes the costs of producing and distributing graded milk. His margin of profit is high and likely to remain high for his sales are growing, and the demand for his milk is greater than at present he can supply. To

TABLE IX.—VARIATIONS IN MILK PRODUCTION ON DIFFERENT FARMS IN THE SAME YEAR.

No. of cows	890	Average of 28	A.	B.	C.	D.	E.	F.	G.	H.
COST OF UPKEEP PER COW.										
Grazing and forage	...	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Hay and straw	...	5 0 5	6 10 11	3 14 9	8 16 2	3 9 5	4 14 0	5 9 5	6 10 10	4 16 8
Roots	...	3 13 3	8 10 3	3 4 0	4 9 5	3 5 7	3 2 4	3 2 4	3 10 10	3 12 8
Concentrates	...	3 11 11	5 8 7	2 0 11	—	2 10 4	0 14 7	0 14 7	2 10 11	3 13 5
	...	11 12 4	21 7 10	13 16 9	16 8 7	6 4 11	11 19 5	17 15 7	7 11 4	5 8 11
TOTAL FOOD	...	23 17 10	41 12 9	22 16 5	29 14 2	15 10 3	26 3 5	27 1 11	20 3 11	17 11 8
Depreciation	...	2 14 8	—	2 16 1	8 4 4	3 4 4	5 15 0	—	—	4 19 9
Sundries	...	3 4 9	1 16 10	7 5 2	2 17 3	3 6 11	3 12 1	2 9 5	0 3 5	2 2 10
Labour	...	9 10 8	11 8 3	16 10 2	20 4 1	13 3 1	11 19 5	8 14 8	5 14 7	8 10 9
GROSS COST	...	39 7 11	58 17 10	49 7 10	60 19 10	35 4 7	47 9 11	38 6 0	26 1 11	33 5 0
Less manure	...	2 10 7	4 9 3	3 18 4	3 8 3	2 14 0	—	2 18 5	1 18 0	2 13 3
Less calves	...	0 4 5	1 10 4	0 19 7	—	0 13 3	—	0 9 0	0 6 0	—
Less appreciation	...	—	2 18 0	—	—	—	—	0 2 11	0 18 10	—
NET COST	...	36 12 11	46 0 2	44 9 11	57 11 7	31 17 4	47 9 11	34 15 9	22 19 1	30 11 9
Average milk yield per cow		gallons. 542	gallons. 906	gallons. 685	gallons. 539	gallons. 589	gallons. 771	gallons. 661	gallons. 501	gallons. 622
Average cost of production per gallon		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Average selling price		0 1 4½	0 0 11	0 1 3¼	0 2 1½	0 1 1	0 1 3	0 1 0½	0 0 11	0 0 11½
Average sales per cow		0 1 6½	0 1 8	0 2 3	0 2 3¼	0 2 5	0 1 6	0 1 6	0 1 6½	0 1 0
Average profit per cow per year		43 13 3	74 7 9	71 3 0	62 10 8	62 7 5	58 1 4	50 2 1	39 8 3½	31 2 0
Average profit per cow per week		7 0 4	28 7 7	26 13 1	4 19 1	30 9 8	10 11 5	15 6 4	16 9 2½	0 10 3
Average profit per gallon of milk		0 2 8½	0 10 11	0 10 3	0 1 10½	0 11 9	0 4 1	0 5 11	0 6 4	0 0 2½
Profit as percentage of production costs		16%	63%	60%	84%	97%	22%	44%	72%	11%

meet this demand he is increasing his herd, though he has had to enlarge his byres at his own expense, and without the written consent of his landlord, knowing that by so doing he would most probably forfeit the right to any compensation if he leaves the farm.

Every farm has its own particular problem to solve, and as far as I have been able to see, on no two farms are these problems identical.

In the case of "A" it was a marketing problem. He has solved it by making the most of his limited market for milk, and branching out as far as output is concerned in other directions, in which the demand is not so restricted. On this farm as far as milk production is concerned, it has been a case of high output, low costs, big margin of profit per cow, heavy milk yield but *limited demand*. From its situation one would not expect a good market for milk, and one has had to be found by building up in the local town a small retail milk round. Retailing the milk of 14 cows he is doing well, as his total profit left by these last year amounted to £397 5s. Were he to increase the herd the additional milk produced would have to be disposed of wholesale outside the district and fetch a poor price. He has realised that it is no use producing milk for which there is no good market, and no demand except at an unremunerative price. It is the wise man who *realises his limitations* in milk production as in anything else. This man, realising that he had reached his economic limit as far as milk production is concerned and looking round for other remunerative sources of production, turned his attention to poultry. Starting six years ago with a flock of 121 laying birds, he has from this nucleus, at very little expense, built up one of well over 1,200, which left him a net profit of no less than £556 4s. 9d. for the year ending 30th September, 1927.

"C" has his problems, technical and not marketing problems, the problems of ordinary farm management, which in these days should present little difficulty; problems involving the better management of his grassland and of his dairy herd, the rationing of his cows and the organisation and control of his labour. Too frequently one finds that high "technical skill" in the management of the herd, is made of no avail through the lack of organisation and business ability in the disposal of the milk. Here the case is reversed, and it cannot be too strongly emphasised, that the one must be the corollary of the other, and that real and lasting success can only be built up on good management on the side of both production and disposal.

"D" has his problem which is not yet solved, though the solution lies ready to his hand, a problem which if not solved, and solved quickly, is bound to prove his undoing, it is the problem of *giving satisfaction to his customers*. What strikes one on this farm is the low cost of production, the high selling price, and the abnormally high profits which, under present conditions, are hardly likely to be maintained. The cows are kept cheaply, possibly too cheaply, but the thing that really matters is the fact that this man is retailing at Grade A prices

bottled milk which is not of Grade A quality. Success in any commercial undertaking, whether agricultural or otherwise, is built up on repeat orders. Regular customers are a far more important factor in success than casual ones, and regular customers can only be maintained by treating them fairly and giving them satisfaction, and a customer once lost through dissatisfaction is very difficult ever to get again on one's books.

"E" has his problems which he is only just beginning to solve; the problem of heavy overhead and direct charges; the problem of cashing the accumulating fertility of his soil; the solutions to which may largely lie along the lines of not putting all one's eggs into one basket.

This farm is a small holding of 32 acres, concentrating on milk production on the soiling system. The land has been for six years well cleaned and well manured with the dung of well fed cows, and there is no doubt that the fertility of the land had been accumulating rapidly. Excellent crops have all along been grown, but up to last year all these crops had been cashed through the cow. What was wanted was some modification of the system by means of which some of these could be short circuited and cashed direct. Owing to the limitations in demand; as the fertility of the soil increased, no more cows were being kept, and no more milk was being produced, while there was no marked increase in the Tenant Right Valuation allowed by the valuer, actually since 1923 the valuers have been busily engaged in writing down the Tenant Right Valuation. On a small holding of this description, devoting the whole of its energies to milk production alone, difficulties must be experienced in utilising the labour and raw materials to the best advantage, while difficulties must perforce be experienced on account of the heavy overhead charges it must have to carry. The 1926-27 records on this farm are interesting, for the first time sale crops have been grown, and with the actual on-costs down by £46 there has been an additional production of potatoes to the value of £161 15s. On this farm the milk production may still be continued on soiling lines, the same number of cows may still be maintained, and the same quantity of milk produced, while with very little alteration in the on-costs additional output might be obtained from potatoes, sugar beet, pigs and poultry.

"G" has his problem, the problem of learning to spend wisely on the essentials of productive expenditure. His markets are good, he can sell at a good price all the milk that he produces, but he is producing far too little because he is spending too little. In spite of his low output he has done well, on account of high selling prices and the drastic cutting down of production costs. One wonders what might be the possibilities of a man in his position, if only he would spend more on essentials and increase his output. The overhead charges on this farm are low, but too little is being spent on raw materials, labour, artificials and purchased foodstuffs, while his net

financial returns are due to low expenditure rather than to high production. His crop yields are none too high, his grassland wants liming and is under-stocked, while his cows in spite of recent improvements in this direction are still underfed, particularly as far as concentrates are concerned. If it pays any man to force for milk, it will pay a man in the industrial area where markets are good and prices rule high.

"H" has his problem, a marketing problem, to which he alone can find no solution, though the solution could readily be found along the lines of united and co-operative effort. His farm is situated at the head of one of the Dales, within a stone's throw of the railway station. His cows are kept cheaply and milk well, with the result that the cost of production of the milk is low, yet the margin of profit has been small owing to the low price of its disposal. There is no doubt that the crying need of this area is the reorganisation of the disposal of their milk. This man's milk produced in the Dales is wholesaled to Leeds at low prices, retailed in Leeds at high, and until the milk producers in this and similar areas are better organised for the collective disposal of their milk, so long will they have to be content to receive too low a proportion of the price paid by the consuming public for the milk which they have produced. How far it would be a more economic proposition for many of the producers in this and similar areas to revert back to their original practice, and cash their milk in the form of pork, cheese and possibly beef, rather than in the form of liquid milk is quite an open question.

"F" had his problems, most of which he has now solved. The poverty and sourness of his soil, the bleakness of his position, the isolation of his buildings no longer worry him; the heavy depreciation of his cows is a thing of the past; what he does not know about the feeding of cows is not worth knowing; the system recently launched by Boutflour as some new thing, he was practising, and practising with success, 10 years ago. Yet when he asks me if he should go further and modify the method of his disposal of his milk, as most probably it could be modified with slight financial success, I reluctantly dissuade him from the project and advise him to let well alone.

Situated in the industrial area of the West Riding, 1,000 feet above sea level, on land which 40 years ago was little more than moorland, this man by the application of lime, slag and close grazing has improved his grassland almost beyond recognition, and more than doubled its stock-carrying capacity, until to-day this grassland farm of 92 acres, of which only eight are under the plough, carries 67 cows, 9 other head of cattle, 97 pigs and 100 head of poultry. His purchased foods have been bought with judgment and an eye to the market, while, in addition, they have been fed to each individual cow in proportion to her milk yield. Originally going in for "Milk and Feed" he has recently modified his system and bought younger cows which he has bulled and kept round twice, cutting down his depreciation

from 6d. to just over 1d. per gallon, while last year, for the first time, his cows actually showed appreciation, a thing which in a district like this is looked upon as almost an impossibility. Personally, I know few farms which it is such a pleasure to visit, which are so well managed and which leave such good financial returns as does this bleakly situated farm. To me, it stands as a revelation of what can be done to-day in the farming industry given a man of personality and adaptability and a *market*.

"B" has his problems, every one of which he has solved. Shortness of capital, once a nightmare, now no longer worries him, technical skill and business ability he has been accumulating and developing, and developing while he was accumulating his capital and keeping it in circulation. Neither I nor any other man could teach him much as to the management of his business, but he is always ready to learn. Put up to him a business proposition and he will look at it; suggest to him that Boutflour has new and possibly far reaching views on the feeding of dairy cows, he will go down to Wiltshire to meet him, discuss the matter with him, and give the system a fair trial; suggest to him that we have not yet heard the last word on grassland treatment, and he will not only ask for further information, but after careful consideration act upon it. Put up to him the proposition that there is a demand for a graded milk of higher quality, he will make every preparation for its supply, and keep its quality uniformly high and its delivery regularly up to time. Has he a difficulty with a water supply he will get one laid on. Is the cream line in the bottle not as clear as he could wish, he will introduce a few Guernseys into the herd, to give the milk a richer colour and more attractive appearance. Suggest to him that there is a well-watered hillside farm doing little good, he will ask what can be done with it. Suggest pigs, he will build up a herd of 22 breeding sows at little expense, and while he is increasing his output of milk will at the same time increase his output of pork, with practically no increase in his overhead charges, but only in those of his raw materials.

This man and this type of man will make money on milk production and make money on farming, however hard the times.

The man who will make a success of milk production, or of farming as a whole will be he who makes a close and detailed study of his own individual problems, and lays himself out to solve them on the most practical lines and to the best of his ability.

OILINESS IN MILK.

By A. T. R. MATTICK.

(*The National Institute for Research in Dairying, University of Reading.*)

A VERY important property of milk in addition to the percentage of butter fat, solids-not-fat and its keeping quality is its flavour upon which the general quality is often judged by the consumer.

The present state of knowledge of the precise causes and origin of many flavours in milk is decidedly incomplete, and a common way of attempting to eradicate a pronounced and persistent flavour is to make changes in the foods fed to the cows. In some cases this method is successful, but often it proves to be ineffective. In a limited number of instances (for example, with some members of the cabbage family) foods are known to be the cause of taints, but in a large percentage of cases foods are not the cause. Bacteria which may occur in large numbers in milk taken under unhygienic conditions have also been shown to give rise to numerous taints in milk. This article is concerned, however, with a taint which is due to none of these causes.

In recent years many complaints of a taint in milk generally described as "oiliness" have reached the National Institute for Research in Dairying from farmers, dealers and consumers.

The flavour in its early stages is not appreciated by some people, but in typical cases it is very objectionable and suggests the addition of castor oil to the milk.

A peculiar feature of the taint is the fact that the great majority of complaints are received in the cold months of the year to which it appears to be confined. The development of the flavour is the same in all cases.

Milk leaves the farm in a perfectly satisfactory condition in the evening, but on arrival at the distributor's premises it is found to have become oily, often to such an extent as to prohibit its sale. Despite all the efforts of the farmer to remove the cause of the trouble by improvements in his methods of milking and cleaning his utensils, whitewashing his sheds and changing his rations, the development of oiliness continues.

A large number of instances are on record of serious losses of customers by dairymen who have had oily milk. The whole output of large dairies over long periods have been refused by the buyers and serious losses occurred.

The trouble is not confined to farmers, but occurs sometimes with disastrous results in milk plants.

It was originally believed that owing to the invariable presence of a definite time factor in the development of the taint that bacteria were the cause of the trouble.

This view was supported by the fact that large numbers of organisms were present in the samples examined. Many bacteria and other micro-organisms were isolated, inoculated into milk kept under the prescribed conditions for the necessary length of time and examined for oiliness.

In spite of the fact that a large number of combinations of organisms were made and added to milk no flavour quite identical with oiliness could be induced, although some flavours (none of which, however, developed within the usual time) resembled it. It was not until several samples of milk, which on examination proved to contain an extremely small number of organisms of any kind, that other causes were suspected.

Finally, a visit was paid to a large herd of more than 150 cows from which no milk had been sold for many days because of oiliness.

Examinations of the cows showed no abnormalities to account for the taint, but the cooler was found to be old and dirty. The farmer was advised to replace it; when this was done the taint disappeared. A bacteriological examination of the organisms washed from the cooler with sterile water failed however to disclose any which could give rise to oiliness.

When the milk containing practically no bacteria was passed over this cooler after it had been completely sterilised, the taint was found to develop within a period which varied from 12—24 hours. Subsequent bacteriological examination showed no increase in the small numbers of bacteria originally present in the milk. It was therefore unlikely that bacteria were the direct cause.

Finally, the causative agent was shown to be copper (of which most coolers are made), which dissolves in small quantities in the milk as it passes over the surface from which the tinning has worn away.

It was found that a very small and apparently insignificant area of exposed copper is sufficient to spoil a large quantity of milk, and that it is unsafe to use a cooler from which the tinning has worn away.

Chemical tests applied to the first stream of milk passing over such a cooler show the presence of appreciable but very small quantities of the metal.

The amount of copper taken up by successive quantities of milk is much smaller, but in some cases is sufficient to induce oiliness.

Copper strainer gauges are also responsible for oiliness in milk since their large surface results in the solution of appreciable quantities of copper.

In milk plants and in any apparatus where milk and copper may come in contact enough of the metal to cause the taint is at all times liable to be dissolved, but particularly in places where the tinning has worn away.

A so-called "plant taint" which is well known in pasteurising depots appears to be due to the presence in the milk of sufficient copper to give the milk a definite astringent metallic flavour. This flavour is evident at once and does not require the passage of time for its development.

Oiliness is really due not to the presence of copper, but because the metal, acting as a catalyst, causes the oxidation of the fatty acids in the fats with the production of unpleasant smelling and tasting compounds of rather indefinite composition.

Similar changes occur in butter which containing traces of copper is stored for a long time.

The development of oiliness is to some extent independent of temperature and is able to proceed in the winter in England. At this season the growth of bacteria is slow and oiliness develops unimpeded.

In warmer weather, however, since the small amounts of copper present are unable to affect the growth of bacteria their increase is very rapid and the enzymes produced by them break down the compounds in the fats formed by the agency of copper as fast as they are formed and no oiliness appears, the milk going sour or otherwise spoiling in the ordinary way.

A STUDY OF THE INHERITANCE OF MILKING CAPACITY IN PEDIGREE DAIRY SHORTHORNS.*

By SANTOKH SINGH, M.A., N.D.D.

INTRODUCTION.

THE literature on the subject is strikingly small owing to the meagre records available on the milk yields of cows, and considerations of time and expense in performing experiments with dairy animals. In fact, little is yet definitely known regarding the inheritance of the quantity of milk from the parents to the progeny. Historical evidence is too scanty to throw any light on the problem. The little historical account that is available about dairy cattle only indicates the methods employed by early breeders to improve dairy stock. "Breeding best to best to produce the best" has been the fundamental practice of all the early master breeders. Experience taught them that this was not a law, but undoubtedly the best policy, to improve their stock. In selecting the best lay the art of the early breeders who judged and weighed the animal in the light of their own experience in order to produce the type they had in view.

It was the purpose of the writer originally to investigate certain aspects of the inheritance of the quantity and quality of milk in pedigree Dairy Shorthorn cattle, but owing to the lack of data regarding quality, the study has been restricted to the inheritance of quantity of milk only. Considerations of time and the difficulty of collection of data has obviated the possibility of taking large number of animals into account. It was thought fit to study one family of pedigree cattle as thoroughly as possible with the records available rather than launch a more ambitious scheme of work. The family selected for the purpose—the progeny of the famous cow Darlington Cranford 5th—is considered to be one which has been greatly instrumental in producing some of the best Dairy Shorthorns of to-day.

RESUMÉ OF WORK BEARING ON THE SUBJECT.

As mentioned before in the introduction, very little work has yet been done on the subject, and so there is a great scarcity of literature on it. The following is a summary of the investigations carried out at a few agricultural experimental stations :—

(1) Gowen, of Maine Agricultural Experimental Station, Orono, U.S.A., dealing with some of the popular dairy breeds in the United States, describes a test of measuring the transmitting

* (The work involved in the preparation of this paper was carried out during a period of post graduate study at the National Institute for Research in Dairying, Shinfield, Reading.)

qualities of sires to their daughters with regard to yield of milk and butter fat. He states—

(i) That a sire has a beneficial effect on the herd if the yields of his daughters exceed the yields of their dams; the amount of this excess, he holds, is due to the contribution of the sire to the daughter.

(ii) That there appears to be little or no influence of inbreeding, of relationship, and of famous ancestors on the production of the progeny of dairy sires. And that the inbreeding and relationship which occurs in ordinary pedigrees as found in pure bred animals is relatively small in amount.

(iii) That the evidence from extensive experiments (on small animals particularly) shows that very intensive breeding such as mating of brother and sister for a number of generations will generally result in the concentration of prepotency of this animal, but also in decline of vigour in such inbred animal and a probable reduction in fertility.

(iv) That full sisters resemble each other more in milk and butter fat yields than half-sisters either by common sire or common dam.

(v) That the yield of milk and butter fat of daughters has a close resemblance to the yield of milk and butter fat of their dams. It is noticed that as the yield of milk and butter fat of a dam increases, the yield of milk and butter fat of her daughters also increases.

(vi) That the inheritance of butter fat is quite independent of milk yield, yet it seems to obey the same laws in transmission.

(vii) The effect of grand-parents is less than that of parents on the yield of milk and butter fat of the progeny. If the paternal grand-dam is a poor or heavy milker, the grand-daughters may also be poor or heavy milkers as the case may be, but there will be a greater variation in the yields of grand-daughters.

(viii) Cousins are half as much indicators of yields of milk and butter fat as grand-parents. So the performance of a bull's brother's daughters are a very little indication of the worth of the bull.

(2) Dr. Crew, of Edinburgh, mentions in the *Scottish Journal of Agriculture*, July, 1923, that milk yield is held to be a dominant physiological character in inheritance by a French genetist, whose paper appeared in the "*Transactions of the French Academy of Agriculture*."

(3) Professor J. Wilson concludes that—

(i) As the bulls rise in milk breeding capacity, *i.e.*, as the average of their daughters' yields rise, the yields of their best and their worst daughters generally rise.

(ii) The gaps between their best and their worst daughters'

yields generally widens, as the bulls rise in milk breeding capacity.

He also suggests that there are 16 different grades of milk yields, and that inheritance of milk yield depends on four pairs of factors which obey Mendel's law of inheritance. Each of these factors represents a definite amount of milk, and those factors representing higher amounts are dominant.

Investigations of the above scientists have not yet been confirmed. Several different views are held *re* the inheritance of the yields of milk and butter fat, but no scientific proof is available at present to support them.

PARTICULARS OF DATA.

For the purposes of this paper, investigation was directed towards the Pedigree Dairy Shorthorn herd at Tring Park, Hertfordshire, bred by the late Rt. Hon. Lord Rothschild, whose herd has had a profound influence on the Dairy Shorthorn animals in the south of England. This herd was selected for investigation as it was likely to contain more milk records than any other, having been one of the first to take up milk recording. Another reason for the selection was the widespread reputation gained by dairy bulls and dairy cows bred at Tring Park. In the introduction of sale catalogue issued on June 3rd, 1915, after the death of Lord Rothschild, is contained the following brief statement regarding the aims with which the animals were bred at Tring Park:—

“For the last 18 years the herd has been built up with extraordinary care and good judgment, the object being to produce a herd of large framed, good fleshed cattle, with heavy milking qualities combined with strong, robust constitutions and entirely free from tuberculosis. A large number of animals are bred from purchases made from the leading breeders in Cumberland and Westmorland, and privately from the late Mr. George Taylor, at Cranford, and from these some of the most celebrated Dairy Shorthorns of recent years have been descended. Amongst them was the great prize cow Darlington Cranford 5th, then only a small calf; she gave an average of 10,174 lbs. of milk for 10 years and produced three bulls, Conjuror, Dreadnought, and Foundation Stone, that have been used in the herd with very great success.”

Therefore, the investigation was directed to the progeny of this celebrated cow, Darlington Cranford 5th, born on October 26th, 1897, and bred by Mr. G. Taylor, but owned by the late Lord Rothschild. Her performance was one of continuous high production of milk over a long period of 10 years. She won many prizes, including first and special in the butter fat test at the R.A.S.E. Show, 1908, and first in milking trials, both in 1908 and 1909. There could be no doubt that she inherited milking capacity from her parents*, without which

* An extended pedigree of Darlington Cranford 5th is given at the end of this paper.

it is impossible to set up such a record on good feeding and management alone. Good management will increase milk yield and produce milk economically, but without inherited capacity for milk production a cow could never set up such a heavy average record. Besides, she was a fertile animal producing 10 bull calves and 3 heifer calves. The following remarks concerning the progeny of Darlington Cranford 5th, will reveal such information as could be obtained about them. To study the inheritance of milk yield to the second generation it was considered advisable to take the grand-daughters of Darlington Cranford 5th, both by her sons and daughters.

SOURCES OF DATA.

The main sources of data were Coates Herd Book, the Dairy Shorthorn Association Year Books, and the Catalogue of Pedigree Dairy Shorthorns issued at the Tring Sale in June, 1915.

Much difficulty was experienced in tracing the progeny of individual animals. There is no definite system by which one could find out all the bull calves and heifer calves of a bull or a cow. In case of the change of ownership of an animal it is comparatively easy to trace the progeny of a cow, by looking up the indexes of a number of Herd Book volumes, but the bulls are not indexed, though each has a number assigned to him. To find out the progeny of a bull it is essential to know the name of the owner to whom it has been sold, and more often than not it is difficult to find the buyer. Some help may be derived from the sale catalogues appended to the end of each year's issue of The Dairy Shorthorn Association Year Book, but only a few well-known sales are mentioned there. Occasionally the private catalogues issued by the breeders on their sales contain more information on this point, but here, again, only a few breeders issue such catalogues. The Herd Book is generally silent on the point. Therefore it is difficult to distinguish an untraceable animal from one which may have died. For the same reason one cannot definitely state that one has got all the offspring of a certain bull, unless full records be found for the whole life of the animal. Due to the lack of such information it has not been possible to trace some bulls at all. Sometimes it happens that after having found out the new owner, one cannot still get any information about the progeny of the bull as the owner may not be recording his herd in the Dairy Shorthorn Association's Registers. Again, the services of a bull lent to other herds, are not accounted for anywhere. This constitutes another source of difficulty in collecting full records of the offspring of a bull. It is realised that unless all the offspring of an animal are taken account of errors may arise in attempts to measure the effect of an animal in increasing or decreasing the milk yields of a herd.

The difficulty does not end here, but becomes more pronounced in finding out the performance of the daughters. It is admitted generally now that the performance of daughters is the best measure

of the worth of a sire. We are concerned here with the milk yields of the daughters. To find all the milk yields of a cow is no easy matter from the records available in the Dairy Shorthorn Association Year Book.

Cows are not entered in an alphabetical order, but are grouped under their owner's name. Of course, the name of the breeder is given in a separate column, and it is only through this column that it is possible to find the cow and its milk yield, by first looking up the name of the breeder and then ascertaining the name of the cow. Because records omit to show the change in the ownership of the cow, whether she dies or passed into a herd where milk records were not kept a complete life history may not be obtainable. To be sure that one possesses all the available records in respect to an animal one must look for the name of the breeder in all the herd books, verifying the name of the cow under consideration. Such a procedure makes the investigation very tedious and laborious, absorbing a large amount of time collecting data of dairy animals.

Bearing in mind the foregoing facts it is not surprising to note that all the daughters of a bull are not recorded, nor are the records of performance complete regarding such daughters that are recorded. In fact, most of the daughters have no performance records, because the Herd Book entries of animals started long before the recording of their milk yields, which is comparatively a recent movement. In the next few decades there will accumulate valuable data regarding the performance of cows in the way of milk yields.

Apart from giving an impression of the nature of the difficulties involved in collecting data *re* pedigree animals, it is hoped that the above remarks may be instrumental in helping to improve the recording of such animals in future.

DATA AVAILABLE.

The data collected is, perhaps, comparatively small to the time spent in bringing it to the surface. The difficulties of collecting such data as explained before, and the desire to find out every possible information *re* the animals under consideration, were both responsible for the small number of facts collected. The following is a description of the data collected:—

Darlingford Cranford 5th was a cow in the Tring Park herd who gave an average of 10,174 lbs. of milk over 10 years. The point under investigation is how far the progeny of this cow inherit her productive powers in the way of milk yield.

The investigation began with finding out the number of calves she produced and their performance. Also the grand-daughters of *Darlington Cranford 5th* by her sons and daughters, and their milk yields. A full statement of the information collected is appended at the end. The following are particulars available regarding the sons and daughters of *Darlington Cranford 5th*.

(1) and (2) *Darlington Cranford 10th** and a bull calf, twins; both red and little white; born on August 22nd, 1900. Breeder, Lord Rothschild (Vol. 47, p. 744). Sire, Islinglass 74749. The bull calf was not bred from, and no calf was found to have been born to *Darlington Cranford 10th*. Being a twin to a bull it is very likely it did not breed.

(3) *Darnley 80847*; red and white; born November 20th, 1901. Breeder, Lord Rothschild (Vol. 48, p. 798). Sire, *Magna Charta 77166*. Very little information is available regarding *Darnley*. Lord Rothschild does not appear to have used him in his own herd. There was no information in the sales catalogues regarding the sale of *Darnley*. It was supposed that he had died, until the name appeared accidentally while looking up the daughters of *Daffodil*—another daughter of *Darlington Cranford 5th*. There was one heifer calf by him and *Daffodil*, but the animal died. From this source it was found out that *Darnley* was used in another herd and four heifer calves were got by him; after that again *Darnley* disappeared into obscurity. No milk yield for the four daughters was found.

(4) and (5) (a) *Druid 102056* and (b) another bull calf (twins); *Druid 102056* was red and little white, whilst the twin calf was red and white in colour, born February 7th, 1903. Breeder, Lord Rothschild. Sire, *Magna Charta 77166*. The herd book contained information to the effect that *Druid* was sold to another breeder under whose ownership the bull had eight daughters, but there is no information on their milk yields in the Shorthorn Association Year Book, except one. The figures available only show annual milk yields. Since a statement of the yield in 12 months can very rarely be reduced to lactation yield, such information supplies little material to assess the milking capacity of the daughter.

There is no further information regarding *Druid* or his offspring. The other bull calf born twin with *Druid* was slaughtered.

(6) *Daffodil* was the sixth offspring, red and white in colour; born on April 21st, 1904, and bred by Lord Rothschild. Sire, *Magna Charta 77166*. *Daffodil* has three milk records in the Shorthorn Dairy Association Year Book, but only one of them could be taken as a lactation record of first 315 days for her sixth lactation. She had two bull calves and one heifer calf, but the latter died soon after birth.

(7) *Conjuror 91310*, the seventh offspring of *Darlington Cranford 5th*, roan in colour; born on June 14th, 1905. Bred by Lord Rothschild. Sire, *Baron Bates 82779*. *Conjuror*, a very well-known bull was used in the herd at Tring Park. He had 85 daughters, out of which milk records for only 20 are available.

(8) *Diadem*, the eighth offspring, a heifer; red in colour; born June 22nd, 1906. Bred by Lord Rothschild. Sire, *Magna*

* This animal must not be confused with another *Darlington Cranford 10th* by *Wild Prince 9th 78179*, bred by Mr. G. Taylor (Vol. 56, p. 1167).

Charta 77166. She had one daughter, whose milk record for her first lactation is available only. For Diadem, three annual milk records were found, of which one could be taken as a lactation record, starting her lactation on September 16th, 1913.

(9) *Dreadnought* 102049 was another famous bull used in the herd at Tring Park, roan; born on April 9th, 1908. Bred by Lord Rothschild. Sire, Traveller 93667. He had 45 daughters, out of which milk records for only 12 are available.

(10) *Foundation Stone* 105524 was a bull of very wide reputation, red and little white in colour; born on May 27th, 1909. Bred by Lord Rothschild. Sire, Traveller 93667. This bull was used in three different herds, giving a total service of 13 years. At Tring Park he was used till 1915, when he was sold at the late Lord Rothschild's sale on June 3rd, 1915, for 200 guineas. In 1921 he was again sold for 450 guineas. During the whole of his service period he sired 103 daughters of which milk yields for only 34 are available.

(11) *Combination* 108237, dark roan; born May 23rd, 1910. Bred by Lord Rothschild. Sire, Conjuror 91310. No information is available about this bull.

(12) *Defender* 115022, roan; born January 6th, 1912. Bred by Lord Rothschild. Sire, Dazzler 101975. This bull was sold for 500 guineas. Only eight of his daughters have been traced, and the milk yield for only one is available.

(13) *Dukedom 2nd* 119957, red and little white; born September 23rd, 1913. Bred by Lord Rothschild. Sire, Masterpiece 112477. No information again is available regarding this animal.

REDUCTION OF RECORDS TO A COMPARATIVE BASIS.

The knowledge of a simple milk yield of a lactation period is not a sufficient guide to judge the milk producing capacity of an animal. A few days' milk yields, or yields for a part of a lactation period, are still less satisfactory for this purpose. To draw any conclusion from a record of performance, *i.e.*, a lactation milk yield, without applying any correction to it, therefore, would be erroneous. Milk yield is affected by many factors and varies considerably during a lactation period, and from one lactation to another. The milk yield must be reduced to a common basis before comparing it with that of another animal reduced in a similar way. For this purpose records of milk yields must be available by lactations and not by the year. The latter gives little information on the milking capacity of an animal, as it includes the milk of parts of two different lactations, which is generally the case, except when the lactation starts soon after the beginning of the milk recording year, *i.e.*, in October. In that case the annual yield will correspond with the lactation yield provided the cow goes

dry before October next year. Many milk records available are only on the annual basis, hence of little value for the purposes of comparison in milking capacity. Apart from the yield of milk in lactation, such information as (1) the date of calving; (2) length of service period after calving; (3) the number of lactation periods, and (4) the length of dry period, are necessary for reducing the milk yield to a common standard. Of these, information as to the length of the dry period is difficult to obtain, as the actual length of lactation period is often not given. The yield of first 315 days is recorded as the milk yield of that lactation.

For the purposes of comparing different cows in respect of their milk yields, therefore, the yield of a lactation period should be taken as a standard in which the cows generally produce the maximum amount of milk. For example—Sanders and Hammond have found by extensive study of milk records that a cow gives the maximum amount of milk in her sixth lactation period. Hence the yield of this lactation period is used as a standard for comparison. Of course, the milk yield of sixth lactation period would only be a reliable maximum yield if such a yield is produced under certain definite conditions, which Sanders and Hammond call *normal conditions*, i.e., calving in either months of January or March; having been dry for 40 days; and having been served 85 days after the date of previous calving. Variations in any of these factors tends to produce abnormal variation in the amount of milk of any lactation period. The following factors seem to affect the milk yield of a cow for which corrections should be applied: (1) seasonal variation; (2) effect of pregnancy; (3) the age of the cow; (4) and the length of dry period.

(1) *Seasonal Variation*.—By extensive study of cows calving in different months of the year, Hammond and Sanders concluded that autumn calvers usually gave more milk than summer calvers, though the summer calvers begin with much higher yields, they fall off quickly with the approach of winter, whereas the autumn calvers keep up a steady yield for a longer period.

(2) *The Effect of Pregnancy*.—When a cow is served a slight fall in milk yield can be noticed, but there is a marked fall at the 20th week after service. If the service of a cow is delayed beyond the usual time after calving the fall in yield described above is postponed accordingly, resulting in a higher milk yield for that lactation. Consequently, a cow served quickly after calving would give less milk in that lactation. Serving a cow after 85 days of calving was taken as normal, because the cow calves again about the same time the following year.

(3) *The Age of the Cow*.—It is a widely recognised truth that a cow increases her milk yield from one lactation to another till she reaches a maximum, and then the yield begins slowly to fall off. Sanders and Hammond found that the sixth lactation was the period of maximum yield of milk and, therefore, proposed to correct all milk

yields to the yield at that lactation, in order to bring them to a common standard for comparison.

(4) *Dry Period* is a period of rest for a dairy cow, and gives her an opportunity to get into good condition before the next lactation, if it is not unduly curtailed. Hammond and Sanders take 40 days to be the mean dry period that should be allowed. The dry period at the end of the first lactation should sometimes be longer, in order to allow the young cow to complete her growth. A short dry period at this stage may have an adverse effect on both the constitution and the milk yield of the cow; therefore, a heavy percentage is allowed in the correction tables.

Sanders and Hammond's correction tables have been used in this investigation, and yields have been corrected as far as information from records was available.

No information on the length of dry period and the time of service was obtainable from the records, therefore, the yields could not be corrected in respect of these factors. In any case the percentages of correction for the above mentioned factors are small in a well-managed herd.

The milk yields have been corrected for seasonal variation and age according to the following table :—

TABLE OF CORRECTIONS BY SANDERS.

Month of calving.		Age.	
Month of calving.	Correction.	Age.	Correction.
	Per cent.		Per cent.
January ...	—	1st Lactation ...	+31
February ...	— 2	2nd „ ...	+18
March ...	—	3rd „ ...	+ 9
April ...	— 2	4th „ ...	+ 4
May ...	+ 4	5th „ ...	+ 1
June ...	+ 6	6th „ ...	—
July ...	+ 6	7th „ ...	+ 1
August ...	+ 4	8th „ ...	+ 5
September ...	+ 1	9th „ ...	+10
October ...	— 5	10th „ ...	+18
November ...	— 4	11th „ ...	+29
December ...	— 6	12th „ ...	+44

TABULATION OF DATA.

The following tables show the milk yields of the daughters and grand-daughters of Darlington Cranford 5th which could be discovered and could also be corrected for age and seasonal variation. The tables of the yields of the grand-daughters by the different sons show

the yields of the grand-daughters' dams, and the increase or decrease on the part of the grand-daughter is also shown.

Cow.

Milk yield.

Darlington Cranford 5th ... 10,174 lbs. average for 10 successive years.

DAUGHTERS OF DARLINGTON CRANFORD 5TH.

Sire of Daughter.	Daughter.	Corrected Milk Yield to 6th Lactation Period.
Magna Charta 77166 ...	Diadem ...	8,495 lbs.
Magna Charta 77166 ...	Daffodil ...	8,840 lbs.

GRAND-DAUGHTERS OF DARLINGTON CRANFORD 5TH BY HER SONS.
Son—*Conjurer* 91310.

Cows mated with Conjurer.		Daughters of Conjurer.			
Name.	Corrected Milk Yield to 6th Lactation.	Name	Corrected Milk Yield to 6th Lactation.	Increase over Dam's Yield.	Decrease under Dam's Yield.
Wild Queen 13th	—	Wild Queen 23rd	8,149	—	—
Arbutus ...	6,810	Azalea ...	4,758	—	2,052
Conishead					
Barrington	8,867	Stella ...	10,320	1,433	—
Dusky ...	8,596	Dot ...	10,769	2,173	—
Passion Flower	3,971	Pamela ...	7,494	3,523	—
Dawn ...	2,344	Daybreak ...	8,426	6,082	—
Dolly Day Dream	7,124	Doralice ...	5,718	—	1,406
Turner 16th ...	3,498	Turner 17th ...	9,385	5,887	—
Wild Queen 21st	7,374	Wild Queen 25th	6,983	—	391
Broad Hooks 3rd	8,614	Broad Hooks 9th	7,846	—	768
Gay Smartly ...	5,124	Gaiety ...	7,304	2,180	—
Aster ...	7,669	Auricula ...	10,628	2,959	—
Fairy Queen 5th	7,457	Fairy Lass ...	7,435	—	22
Lady Vivian ...	6,642	Veracity ...	11,186	4,544	—
Dusky ...	8,596	Deodora ...	9,989	393	—
Dolly Grey ...	7,043	Dorothy's Grand-daughter	9,010	1,967	—
Rosebud 3rd ...	—	Rosebud 15th ...	7,345	—	—
Primula 5th ...	1,647	Primula 6th ...	9,630	7,983	—
Nelly Bly ...	6,304	Nellie ...	7,662	1,358	—
Cherry Bloom ...	8,034	Crystal ...	5,975	—	2,059
		Totals	40,502	5,698
		Average	3,375	949

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Son—*Foundation Stone 105524.*

Cows mated with Foundation Stone.		Daughters of Foundation Stone.			
Name.	Corrected Milk Yield to 6th Lactation.	Name.	Corrected Milk Yield to 6th Lactation.	Increase over Dam's Yield.	Decrease under Dam's Yield.
Dorcas ...	—	Doreen ...	11,657	—	—
Aster ...	7,669	Apple Blossom...	11,818	5,149	—
Cherry Blossom	3,822	Carnation ...	6,221	2,399	—
Empress 3rd ...	—	Empress 4th ...	7,645	—	—
Gaiety ...	7,304	Frivolity ...	6,596	—	708
Moppy Gem 9th	—	Moppy Gem 11th	6,794	—	—
Sanford	6,909	Sanford	7,370	461	—
Empress 5th	—	Empress 7th	—	—	—
Wild Queen 21st	7,374	Wild Queen 32nd	6,516	—	858
Primrose 9th ...	—	Primrose 26th ...	8,186	—	—
Rosie Belle 14th	—	Rosie Belle 21st	9,923	—	—
Azalea ...	—	Aurora ...	8,561	—	—
Crudwell Lily ...	—	Combebank	9,346	—	—
Dolphinlee	—	Lily 2nd	—	—	—
Telluria 3rd	—	Combebank	8,117	—	—
Rosa's Fancy ...	—	Telluria 3rd	—	—	—
Johnby Rose	—	Comb. Fancy ...	5,657	—	—
10th	—	Comb. Johnby	10,666	—	—
Fair Rosamond	—	Comb. Rosamond	8,668	—	—
Scotch Maid 7th	—	Comb. Lovely ...	9,110	—	—
Coral Belle ...	—	Comb. Coral ...	8,526	—	—
Dolphinlee	—	Comb. Rosebud	8,938	—	—
Rosebud 2nd	—	2nd	—	—	—
Telluria Heggles	—	Comb. Heggles ...	5,923	—	—
Bladgon	—	Comb. Waterloo	7,405	—	—
Waterloo 2nd	—	Queen of the	12,989	—	—
Belle of the	—	Daisies	—	—	—
Daisies	—	Comb. Galentia	8,083	—	—
Comb. Galentia	—	4th	—	—	—
Comb. Cowslip	—	Comb. Cowslip	7,709	—	—
2nd	—	5th	—	—	—
Merry Maid ...	—	Comb. Merry ...	8,444	—	—
Comb. Eva ...	—	Comb. Eva 3rd	7,812	—	—
Hadnock	—	Comb. Ringlet	11,092	—	—
Ringlet 37th	—	Comb. Telluria	9,895	—	—
Dolphinlee	—	4th	—	—	—
Telluria 3rd	—	Comb. Folly ...	13,673	—	—
Longhills Folly	—	Comb. Belle ...	8,778	—	—
Coral Belle ...	—	Totals ...	8,010	1,566	—
		Average ...	2,670	783	—

Son—*Dreadnought* 102049.

Cows mated with <i>Dreadnought</i> .		Daughters of <i>Dreadnought</i> .			
Name.	Corrected Milk Yield to 6th Lactation.	Name.	Corrected Milk Yield to 6th Lactation.	Increase over Dam's Yield.	Decrease under Dam's Yield.
Sanford Empress 5th	6,909	Sincerity ...	11,674	4,765	—
Fairy Queen 5th	—	Freda ...	6,939	—	—
Beauty of Cowl 2nd	—	Bounce ...	10,011	—	—
Primrose 6th ...	—	Prospect ...	8,693	—	—
Sunshade 7th ...	4,583	Sunshade 10th	9,206	4,623	—
		Wild Queen 30th	9,004	—	—
Beauty of Cowl 2nd	—	Pretty Lass ...	8,406	—	—
Rose Bud 5th ...	—	Rose Bud 13th	8,860	—	—
Sprightly 7th ...	—	Star Light ...	11,452	—	—
Barrington	—	Barrington	11,353	—	—
Duchess 34th	—	Duchess 52nd	—	—	—
Hampton	—	Melody ...	7,603	—	—
Harmony 2nd	—	Barrington	9,588	—	—
Barrington	—	Cranford 38th	—	—	—
Cranford 29th	—				
		Total ...	...	5,088	—
		Average ...	...	2,544	—

GENERAL CONCLUSIONS.

It would be unwise to make rigid generalisations from the data studied in this investigation, but it will be useful to note certain marked tendencies in the inheritance and transmission of milk yield. Conclusions would have been still more accurate if the performance of all the daughters and sons of *Darlington Cranford* 5th could have been found and the milk yields of her daughters and grand-daughters recorded.

From the information available the following conclusions may be deduced :—

- (1) That *Darlington Cranford* 5th seems to have transmitted her milking capacity to both of her daughters, *Diadem* and *Daffodil*, to a certain measure. The yields of her daughters varies slightly, falling between 8,000 to 9,000 lbs. of milk, but is considerably lower than their dam. It is very likely that the decrease of milk yield in the daughters is due to the inability of *Magna Charta*—

their sire—to transmit a sufficient share of milking capacity in order to increase the yield of the daughter over the dam. It is interesting to note that Daffodil and Diadem are full sisters and that their milking capacity is about the same.

(2) That Darlington Cranford 5th produced three sons of considerable transmitting qualities for milk production—

(a) *Conjuror* successfully increased the milk yield of 12 of his daughters over their dams, but failed to do so in six cases. Some idea of the extent of his prepotency may be indicated by the average increase of 3,375 lbs. of milk for the 12 daughters, and only an average decrease of 949 lbs. of milk for the remaining six.

Similarly, out of five records available for *Foundation Stone* it is shown that he increased the milk yield in three cases and failed to do so in two. His average increase being 2,670 lbs. of milk, and the average decrease of 783 lbs. of milk.

For *Dreadnought* the average increase in two cases is 2,544 lbs. of milk.

(b) It is clear from the above results that the average power for increasing the milk yield of the daughter is far more pronounced in all the three bulls than the inability to transmit that power.

(c) The decrease of milk yield in the cases above seems to be due to the usual variation in the transmitting power of the bull rather than to the inability of the animal to transmit a sufficient share of milking capacity.

In every case of a decrease in the milk yield of the daughter the milk yield of the dam is above 7,000 lbs. But by referring to the data it will be found that the bulls have in a fair number of cases increased the yield of daughters whose dams have yielded more than 7,000 lbs. of milk. Therefore, it will be incorrect to underrate the prepotency power of the bulls.

(d) It is again instructive to note that *Foundation Stone* and *Dreadnought* are full brothers and their average power of increasing milk yield of their daughters is strikingly similar. The average figure for *Foundation Stone* is 2,670 lbs., and for *Dreadnought* 2,544 lbs., in contrast to their cousin *Conjuror's* 3,375 lbs.

(4) That, of course, the transmitting power for milk production of the three bulls is much more pronounced on daughters whose dams were poor milkers.

On reference to data it will be seen that considerable increase of milking capacity is found in the daughters whose dams were poor performers.

(5) That the average standard of milking capacity of the daughters of the three bulls is higher than that of the dams.

The average standard of the dams is indicated by 6,415 lbs. for their milking capacity, while the average standard of the daughter is 8,003 lbs. of milk.

(6) It is evident from the foregoing conclusions that careful selection and grading appears to be the best policy to improve the milk producing capacity of a herd. The basis of selection should be the continual good performance on both the sire's and dam's side of the individual selected provided, of course, that constitution is maintained and the good looks or breed characteristics are not lost sight of. Therefore, a bull selected to grade up the herd for milk production should be descended on both sides from healthy ancestors of high milk producing capacity and good breed type. But the final judgment on the merit of the bull should be delayed till the performance of his progeny is known. Similarly a heifer selected for the herd should be descended from high producers of the desired type on both sides of the ancestry, in order to stand a good chance of getting progeny possessing high milk producing qualities.

Darlington Cranford 5th. Red. Coates Herd Book, Vol. 53, p. 1163. Breeder, G. Taylor.

Sire— <i>Lord Somerset Furbelow</i> 65855. Roan. G. Taylor	<i>G.S.—Lord Somerset</i> 10th 48249. Red and White. J. H. G. Smyth	<i>G.G.S.—Wild Oronian</i> 40927. Roan. T. Wilson	<i>G.G.G.S.—Duke of Oxford</i> 31st 33713.
		<i>G.G.D.—Winsome</i> 20th	<i>G.G.G.D.—Wild Eyebright.</i>
	<i>G.D.—Double Furbelow</i>	<i>G.G.S.—Furbelow Duke 6th</i> 55767. Red and White. Lord Moreton	<i>G.G.G.S.—Fifth Duke of Wetherby</i> 31033.
		<i>G.G.D.—Furbelow Stanton</i> 2nd	<i>G.G.G.D.—Lady Brighteyes</i> 3rd.
Dam— <i>Darlington Cranford</i>	<i>G.S.—Lord Somerset</i> 10th 48249. Red and White. J. H. G. Smyth	<i>G.G.S.—Furbelow Stanton</i> 2nd	<i>G.G.G.S.—Baron Oxford</i> 16th 49090.
		<i>G.G.S.—Wild Oronian</i> 40927. Roan. T. Wilson	<i>G.G.G.D.—Gratitude.</i>
	<i>G.D.—Darlington Stanton</i>	<i>G.G.D.—Winsome</i> 20th	<i>G.G.G.D.—Wellesley</i> 16th 47242.
		<i>G.G.S.—Cambridge Duke</i> 20th 54063. Roan. C. R. Lynn	<i>G.G.G.D.—Charming Furbelow.</i>
		<i>G.G.D.—Beauty of Darlington</i>	<i>G.G.G.S.—Duke of Oxford</i> 31st 33713.
			<i>G.G.G.D.—Wild Eyebright.</i>
			<i>G.G.G.S.—Fifth Duke of Wetherby</i> 31033.
			<i>G.G.G.D.—Lady Brighteyes</i> 3rd.
			<i>G.G.G.S.—Knight of Oxford</i> 3rd 43441.
			<i>G.G.G.D.—Red Rose</i> 12th.
			<i>G.G.G.S.—Viscount Oxford of Elmhurst</i> 48892.
			<i>G.G.G.D.—Duchess of Darlington</i> 5th.

THE BRITISH DAIRY FARMERS' ASSOCIATION, 1876 - 1927.

By R. H. EVANS, B.Sc.

"OCTOBER 24TH, 1876 :—After an agitation extending over nearly two years a meeting was held this, the opening, day of the first Metropolitan Dairy Show, at the Agricultural Hall, Islington."

The above are the opening sentences of the Association's Minutes of its inaugural meeting. From the same source we gather from a paper read by Mr. Sheldon (afterwards Prof. Sheldon) that the Association at the time was known as the "Dairymen's Association." This term evidently gave rise to a certain amount of misapprehension, because "certain of our London sympathisers, more particularly, have understood the term to apply only to the milk salesmen of our towns and cities."

Mr. Sheldon eventually proposed "That a Society, to be called the British Dairy Farmers' Association, be formed." After some discussion the proposition was unanimously carried, and the organisation has been known as such ever since.

Previous to the above date, the only English Societies which paid some attention to the subject of dairying and dairy farming in the British Isles were the Royal Agricultural Society of England and the Bath and West Society, more especially by means of articles from the pens of leading authorities on these subjects, through the medium of their respective Journals. It was felt at the time that these organisations, whose activities embraced agriculture in all its branches, could not afford to devote much time and energy to any special branch, like that of dairying and dairy farming, and the British Dairy Farmers' Association was established to accomplish this object.

The Association thus formed in 1876 has, by careful organisation and the unstinted energy and attention of its pioneers and those who followed them at the helm, developed into the leading society dealing with the subject of dairying in all its branches and ramifications in the world.

The Association was incorporated a Company (Limited) under the Companies Act, 1862, by a Certificate of Incorporation dated the 1st October, 1879, and has remained as such until the present day under "The Companies Acts, 1862 to 1883." The Memorandum of Association was subscribed to, among others, by Augustus Voelcker, Thomas Nuttall, Alfred Tisdall, Edmund Chas. Tisdall, H. S. Holmes Pegler, and John Welford, all of whom were closely associated with the Association for many years after its initiation. Mr. Holmes Pegler is still an active member of the Council, and his long and continued experience of the work of the Association is often of great assistance to it in its deliberations.

To write a complete history of the Association from 1876 to the present day, though of the utmost interest, would take up too much space in our Journal, and we propose confining our attention to a brief sketch of its most salient activities since that date.

1. *The Association.*—The total number of members in 1876 was 178. By 1900 this number had increased to 927. The membership roll reached four figures for the first time in 1906. Owing to various circumstances the number of members decreased during 1911-12, and from 1916 to 1919 a further decrease took place owing to many of the members having joined the Army. At the end of 1918 the number had dwindled down to 981. Since 1920, however, the membership of the Association has gradually increased, and at the end of 1927 it reached the record number of 1,798. There are in addition 18 affiliated Societies. Though this increase in itself is most satisfactory, the number is an exceedingly small one, when we consider the number of dairy farmers and others engaged in the handling of milk and its products in the British Isles. It is to be hoped that during the year 1928—the 50th anniversary of the Dairy Show—the numbers will for the first time reach 2,000.

The work and objects of the Association were soon placed on a sound footing. Its activities included an annual Dairy Show, held in October each year at the Agricultural Hall, Islington; veterinary privileges; botanical privileges; chemical privileges; and educational activities at the Association's establishment, started at Aylesbury in 1888 under the name of the "British Dairy Institute," and a Journal of the Association issued free to members.

The Association has always been alive to the best interests of the British dairy farmer. Problems—which are still more or less unsolved—have from its inauguration commanded the serious attention of its members. The Committee of the Association at its meeting held February 6th, 1876, passed the following resolution:—

"The Committee deplore the existence of Cattle Disease in the neighbourhood of the Metropolis, and think that the regulations

of the Privy Council with respect to the importation of live stock are utterly inadequate for the purpose. They would recommend that all fat cattle should be slaughtered at the port of debarkation, and that store stock and breeding cattle should be kept in quarantine for a fortnight, by which time the possibility of the propagation of the disease would have passed away."

As a result of the representations thus made, the Government appointed a Select Committee of the House of Commons to enquire into all matters relating to contagious diseases of cattle and live stock importations. The Committee's report and its recommendations were in accordance with the demands of the British Dairy Farmers' Association.

The Association has always kept a very watchful eye on all Bills brought before Parliament bearing upon the production and distribution of milk. Dairy farmers and dairymen generally are much indebted to the Association for thus safeguarding their interests.

The promoters of the Association were quite cosmopolitan as regards their roll of members and their activities. Among the members enrolled in 1876 we find in addition to Metropolitan dairymen and English farmers, representative authorities on dairying from Germany, Holland, Bavaria, Russia, and the United States of America. Ever since its initiation the Association has been fortunate in having as members leading authorities in dairying and dairy farming from the above and other countries. This has proved a great asset to the Association inasmuch as it has always been able to exchange views with them on matters pertaining to its activities.

In order to decentralise its activities, and to better serve the British farmer generally, the first Committee of the Association decided to offer gold, silver, and bronze medals for the first cows for dairy purposes; for the best samples of cheese and butter shown, and for implements of merit for dairy purposes, at the London, Frome and Kilmarnock Dairy Shows.

This Medal Scheme has been in existence more or less ever since, and is now in the hands of the Education and Journal Committee. Since 1913 as many as 369 medals have been awarded at various Agricultural Shows and educational institutions throughout Great Britain.

In order to equip themselves still further for the objects the promoters had in view, Mr. Sheldon was asked to attend the Hamburg Dairy Show in 1876, and the report of his visit—published in the first volume of the Journal—affords interesting reading.

Among its past-Presidents appear the names of many exalted and influential persons. In 1876 we find that the Presidential Chair was

occupied by J. G. Crompton, Esq., The Lilies, Derby. In 1886 the Prince of Wales (afterwards King Edward VII) became Patron, which office he held until his death. He was followed in this office by King George V. Space will not allow of our referring to the many distinguished personages who have honoured the Presidential Chair, but the following are still connected with the Association :—

Lord Strachie.
 Rt. Hon. The Marquis of Crewe, K.G., P.C., D.C.L.
 Earl of Dartmouth, P.C., K.C.B.
 Earl of Iveagh, C.B., C.M.G.
 Lord Desborough, G.C.V.O.
 Lord Bledisloe, P.C., K.B.E.
 Lord Daresbury, C.V.O.
 Major Lord O'Hagan.
 Major J. A. Morrison, D.S.O.
 S. Palgrave Page, Esq., J.P.

The first Secretaries of the Association were Messrs. Henry F. Moore and Morgan Evans. Mr. Moore held the office of secretary during the years 1876-77. He was followed by Mr. Holmes Pegler, who acted from 1878 to 1881. Mr. Fred Morrison carried out the secretarial duties during the period 1881-84. Mr. W. C. Young was secretary from 1885 to 1909; Mr. F. E. Harcastle from 1909 to 1916; Mr. B. Ravenscroft from 1916 to 1926; and since his death the post has been occupied by Mr. F. J. Bull.

The first office of the Association was at No. 13, Salisbury Street, Fleet Street. From 1881 to 1895 the headquarters of the Society was at 191, Fleet Street. In 1895, the office was removed to 12, Hanover Square, where it remained until 1913. Since that date our headquarters has been at 28, Russell Square.

2. *Education.*—The educational aspect of dairying and dairy farming has always engaged the attention and the sympathetic consideration of the Association. At its first meeting steps were taken to ascertain the views of prominent members, both in England and abroad, on this matter. All the replies urged that the Association should endeavour to establish a dairy station for Great Britain, at which practical and scientific instruction in dairying and dairy farming could be given. It was pointed out at the time that the only European countries which did not possess such a dairy station were Great Britain and Turkey. The lack of funds, however, prevented the Association from embarking on such a big undertaking until the year 1888.

In 1887 the Council made arrangements to grant Diplomas of First and Second Class for proficiency in Dairy Farming and Dairying,

and arrangements were made to hold the first examination for the same on May 6th, 1887. The theoretical part of the examination was held at the Association's offices, 191, Fleet Street, E.C., and the practical examination was conducted at either a factory or a farm, where there were conveniences for cheese and butter-making.

From the report of the Examiners on the first examination held for the Diploma, it appears that only one candidate presented himself for the Diploma Class I, and he evidently failed to satisfy the examiners. One candidate was awarded a Diploma for Butter-making and Cheese-making (Theory and Practice). Two candidates gained the Diploma for Butter-making (Theory and Practice), and one candidate was awarded a Certificate of Merit for the practice of Butter-making. In 1888 we find that the late John Benson gained the Class I Diploma—the first award of its kind—offered by the British Dairy Farmers' Association.

On November 12th, 1888, the Association's educational work was developed and enlarged by the establishment, close to the town of Aylesbury, of a Dairy Institute, "for instructing male and female pupils in the principles and practice of both butter-making and cheese-making."

The late John Benson—holder of the Association's First Class Diploma in the Science and Practice of Dairy Farming—was appointed Manager and General Instructor.

The British Dairy Institute remained at Aylesbury until the year 1895, when it was removed to Reading, and placed under the management of a Committee representing the Reading University Extension College (now the University of Reading) and the British Dairy Farmers' Association.

In 1895 the late John Benson resigned his post at Aylesbury, on his acceptance of the Directorship of the Midland Dairy Institute, Kingston, Derby. His brother, the late Miles Benson, followed him as Manager of the British Dairy Institute, which post he held until his death in 1914.

In a memoir to Miles Benson, published in Vol. 29 (1915) of the Association's Journal, Mr. William Ashcroft stated that "the Dairy Industry of Great Britain has lost one of its best experts; the British Dairy Institute an unrivalled exponent and teacher; the British Dairy Farmers' Association and the University College, Reading, a most loyal colleague, and many others, including a long list of old and present students mourn the loss of a friend not easily replaced," which sentiments, all of us who knew Mr. Miles Benson intimately, heartily reiterate.

The late John Benson outlived his brother, but in 1925 "the tide which never returns took him from us," and now we mourn the loss of two brothers, who probably did more to further the causes both of practical and scientific dairying in Great Britain than anyone else before them.

The Institute Committee appointed Mr. Alec Todd to the post which had become vacant by the death of Miles Benson, and the unrivalled reputation of the British Dairy Institute in the hands of Mr. Todd is still maintained.

We cannot very well bring these notes on the educational activities of the Association to a close without adding our tribute to Mr. William Ashcroft and the late F. J. Lloyd for the interest and care shown by them for a great number of years in the development of this branch of the Association's activities.

It is incumbent upon us also to place on record here the loyal support which Mr. James Robinson ("Jim") has always given to the three managers of the Institute. "Jim" started at Aylesbury as a boy with the late John Benson, and has ever since, without a break, been closely associated with the work of the Institute. A more capable servant, a more loyal colleague, and a more painstaking and conscientious assistant could not have been found, and it gives us great pleasure to bear this testimony to the character of one, whom we hope, will be spared to carry on the varied duties entrusted to him for many years to come.

3. *The Dairy Show*.—It may be truly said that the original and chief intention of the pioneers of the movement initiated in 1876 was to improve the dairy husbandry of Great Britain, and that in order to attain this object their first and foremost consideration was to hold an annual Dairy Show at the Agricultural Hall, Islington. The year 1928 sees the 50th anniversary of what has come to be known as the London Dairy Show. It has been held each year in October since 1876, with the exception of the years 1916, 1917 and 1918. The holding of a successful Show is of the utmost importance to an Association like the British Dairy Farmers' Association, since the revenue of the Association—apart from the profit obtained during the Show week—would not be sufficient to meet its calls.

In 1900 the total profit of the Dairy Show amounted to £219 14s. 7d. During the period 1900-1912 the greatest profit obtained, amounting to £728, was that of 1906. The least profit made at any Dairy Show between 1900 and 1926 was that of 1911, which only amounted to £95 19s. 10d. A four-figure profit was reached for the first time in the history of the Show in 1913. The amount this year stood at £1,213.

The Council during the last few years has been able to invest a sum of money which brings in a substantial net annual income.

In order to assist our readers to realise the progress the Dairy Show has made during the 50 years of its existence, we cannot do better than compare the entries in the year 1876 with those for 1923.

In 1876 provisions were made for cows, cheese, butter, poultry, goats, roots, grain, hops, dairy utensils, fittings and implements.

The 1876 Committee classified dairy cows into two classes—"Those which are of Channel Islands breed, and those which are not." To each division they assigned three classes—(1) For the best set of three cows; (2) for the best pair; (3) for the best individual cow.

For Class 1 (best three cows in milk, not Channel Islands) 16 entries were made, of which one was not sent.

Forty-five cows were thus actually exhibited in this class. We find that the majority of these animals were "fine Yorkshire dairy cows such as town dairymen love, and these came to the Hall from town dairymen."

The Judges apparently thought a good deal of uniform character in each lot, and the first prize went to Mr. W. F. Carrington's three blood-red Shorthorns, which were hardly in milk, having calved in January and February, 1876.

The following note taken from an account of the first Dairy Show is of interest: "The light roan (the property of Mr. Walters) was a good cow, and a good milker, and recalled the same breeder's *Flora*, which came to grief when the fog choked half the Smithfield Club's beasts one Christmas; and as ill-luck would have it, this the first Dairy Show encountered the first fog of the season, and on Wednesday the cattle were hardly visible until 2 p.m."

Many fogs have been experienced in London since that date, but the arrangements obtaining at the Hall—more especially the lighting—are so much improved, that it is almost impossible for a similar catastrophe to happen.

The variety of breeds shown in this class was small. In addition to Shorthorns and the so-called Yorkshire dairy cows, the only other breed in the class was the Ayrshire.

In Class 2 (for the best pair of dairy cows) the variety of breeds was larger, and included a pair of Herefords, a pair of Red-Polled Norfolks, and a pair of dark-grey Swiss, in addition to the Shorthorns, the Ayrshires and the Yorkshires.

The number of Channel Island cattle exhibited was less than that of the other breeds.

The total number of entries in the cattle section at the first Dairy Show was 140, and there is room to think that with but very few exceptions this number actually put in an appearance.

It is of interest to note the prizes offered in these classes:—

Class 1.	1st Prize, Gold Vase (or money), value	£105
	2nd Prize, Plate (or money), value	... £21
	3rd Prize	... .. £10 10s.
	4th Prize	... .. £5 5s.
Class 2.	1st Prize, Plate (or money), value	... £52 10s.
	2nd Prize	... .. £21
	3rd Prize	... .. £10 10s.
Class 3.	1st Prize, Plate (or money), value	... £21
	2nd Prize	... .. £10 10s.
	3rd Prize	... .. £5 5s.

Among the breeders of the animals shown at the 1876 Show are found Mr. Hobbs and Mr. R. Stratton—names that have ever since been closely associated with the improvement of the Shorthorn breed of cattle.

The next exhibit of importance was that of cheese. Classes were arranged for Cheshire, Cheddar and Scotch Cheddar, Stilton, Derby, Gloucester, and Wiltshire, a class for Any Other Variety, and a class for American, Canadian or Foreign variety. The number of entries in the cheese classes amounted to 111.

Another outstanding feature of the 1876 Show was the Cheese Fair, where each competitor had to exhibit not less than "One ton of cheese of any make or shape shown in bulk" There were 27 entries in this class. Among the competitors are found the names of George Gibbons, of Bath, and Thomas Nuttall, of Beeby, two well-known names in the cheese-making world.

There were 119 exhibits in the Butter section.

There were 25 classes of Poultry—with 473 entries. In the Goat class we find there were 16 entries. Of Roots there were 21 entries.

Provision was also made for grain—this included classes for White and Red Wheat, White and Black Oats, Barley, and Beans. Altogether there were 44 entries in the grain section.

There was also a class for British Hops—with 17 entries.

In the Dairy Utensils, Fittings and Implement class there were 19 entries, bringing up the total number of entries for the whole Show to 928—not a bad beginning.

The progress made since 1876 can best be judged by reference to the number of entries in 1923—the record year.

In 1923 the number of classes for cattle was 36, with an entry of 539 animals.

Milking and Butter Tests	...	...	772 entries.
Goats	...	...	67 "
Poultry	...	...	4,685 "
Pigeons	...	...	3,115 "
Cheese	...	...	488 "
Bacon and Ham	...	...	89 "
Butter	...	...	401 "
Cream	...	...	33 "
Honey	...	...	92 "
Bottled Fruit	...	...	53 "
Inventions	...	...	37 "
Roots	...	...	190 "
Butter-making Contests	...	...	129 "
Milkers' Contests	...	...	43 "
Junket-making	...	...	23 "
Colonial Produce	...	...	3 "
Cow Judging	...	...	7 "

Showing a total of 10,766 entries

The success thus attained is largely due to the growing confidence of the exhibitors in the efficient organisation and the impartiality of the judging obtaining at the Show.

The excellence of the organisation is largely due to the efforts of the late Alfred Tisdall, and since his death, of Mr. S. R. Whitley, J.P., the present Steward of the General Arrangements and Chairman of the Show Committee. Both these gentlemen have had willing and active stewards to assist them, and in Mr. Sidney Edwards, the Hall Steward, they have experienced a most excellent and trustworthy assistant—a man who probably knows more about the geography of the Agricultural Hall than any other member of the Council.

4. *Milking Trials and Butter Tests.*—These two tests are looked upon as the most important events at the London Dairy Show, and competition for the prizes offered is always keen.

The carrying out of the tests involves more work—both practical and scientific—than any other department of the Show. To the ordinary visitor to the Show practically all that is to be seen of the Milking Trials and Butter Tests are the results. Very few people,

however, besides those who are closely connected with the carrying out of the tests, have any idea of the tremendous amount of work which is involved in the preparation for, and the actual carrying through of this part of the Show's activities.

This includes the proper labelling of pails; the weighing of the cattle; the stripping out of the cows during the evening before the test milk is obtained; the weighing of the morning and evening's milk of every individual cow; the sampling (for analyses) of each cow's milk; the analyses of the same for fat and solids not fat; the separating of the 24 hours' milk of each animal; the churning and weighing of the butter yielded by each animal; the working out of tens of thousands of calculations to the second or third place of decimals, &c., &c.

Practically the whole of this work has to be accomplished before the Show opens on the Tuesday. These tests have to be carried out with the utmost care—the least accident makes the test in the case of any individual cow quite void. The working out of the final figures demands meticulous care on the part of those entrusted with the work, because prizes are often decided on figures which differ only in the second or third places of decimals.

Judging from records at our disposal, the first Milking Trials at the London Dairy Show were conducted in 1879. The following letter embodying "some suggestions for a change in the awarding" of the Milking Trial prizes, by Lord Richard Howe Browne, a member of the Council, is of interest, because the suggestions made, and adopted in 1879, still form the basis on which the milking trial points rest. At that early date the Council evidently had among its members gentlemen who took keen interest in the welfare of the Association, and—judging by the letter—members whose foresight is worthy of the highest commendation.

Reigate, 10th November, 1879.

H. S. Holmes Pegler, Esq.,
British Dairy Farmers' Association,
446, West Strand.

DEAR SIR,

I regret that, having been absent on the Continent on business, I was unable to attend the last two meetings of the Council, and I fear that I shall also be abroad when the next meeting is held. I, therefore, send you in writing a few remarks which I had intended to have brought before the Council personally on the subject of the Association Milking Prizes, and some suggestions for a change in the manner of awarding them in future. Should you consider it advisable, I shall feel obliged by your bringing the matter before the Council.

In offering a special prize for "the cow yielding the largest quantity of milk," it must be assumed that the real object of the Association was not so much to single out for reward the animal which happened at the particular date of the Show to be capable of yielding the largest quantity of milk, but the animal which was actually the best milker; that is to say, which possessed in the greatest degree those qualities which would on the whole give the greatest return to the farmer in the shape of dairy produce.

The condition under which the milking prizes were awarded at the late Show of the Association—viz., by simply measuring or weighing the quantity of milk

irrespective of its quality, or of the time that had elapsed since calving—do not seem to me to be calculated to ensure the prize being given to the most deserving animals.

It is quite possible, and considering the time of year at which the Show is held probable, that many cows which would best fulfil the desired conditions, and would, taking the whole year round, yield a greater total return of produce in the shape of milk, butter, or cheese, might be shut out from competing by the fact that they had calved in the early summer, and thus, at the date of the Show, would be giving a much smaller quantity of milk than a recently calved cow of inferior merit.

Again, the simple measurement of the quantity of milk is a fallacious and unsatisfactory test, because certain kinds of food will stimulate the secretions, and increase the quantity of milk, without any corresponding increase in the quantity of feeding properties, and sometimes even at a sacrifice of those properties. Thus the cow which was actually at the time furnishing the largest quantity of food might be passed over in favour of one yielding one additional quart of inferior milk.

It is no doubt difficult to propose any system by which an absolutely accurate test could be secured, but in making the award I would suggest that the following points should be taken into consideration :—

1st.—The quantity of milk. 2nd.—Its quality. 3rd.—The date of calving. The relative value to be awarded under each of these headings is a matter which should receive careful consideration by a Committee of practical men; but as an illustration of the method I suggest, I put forward the following relative values, and the manner in which they might be used in making the award :—

1st.—Quantity. A certain number of points should be given for quantity—say one point for every quart.

2nd.—Quality. A small sample should be taken from each cow's milk, and submitted to the analyst of the Association for a report on the percentage of total solids. The remainder of the milk should be set under charge of the officials of the Association, and the produce in butter weighed, or if this entailed too much trouble, the quantity of fat ascertained by analysis. Three points might be given for every one per cent. beyond 10 per cent. of total solids, and one point for every half-pound of butter.

3rd.—Date of calving. This should be certified, and one point allowed for every two weeks that had elapsed between the date of calving and the opening day of the Show.

The total points gained by each cow should be added up, and the milking prizes awarded to those animals in each class which had gained the greatest aggregate number of points.

The above is merely given as an illustration of the method proposed, but the proportion of points under each head, though the result of some considerable thought, has not been sufficiently worked out to be put forward with any idea that it should be accepted even as a definite suggestion.

I would also suggest that, as in the last Show, the Channel Island stock occupied such a prominent place, and as this class of stock has now attained such an important position in dairy matters, a separate milking prize should be given to them, or to them combined with the Kerry and Bretonne stock. Their characteristics differ so widely from those of the Durham, Ayrshire, or Dutch stock, that they can hardly compete upon a common basis.

I remain,

Yours faithfully,
RICHARD H. BROWNE.

The suggestions made in the above letter were not adopted until each point raised was thoroughly tested. With this object in view, the following table, showing the "Composition of Milk Yielded by Cows of different Breeds shown at the Dairy Show at Islington in 1879," will prove of interest.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.	No. 11.	No. 12.
	Ayrshire Cow.	Jersey Cow.	Jersey Cow.	Jersey Heifer.	Guern- sey.	Cross- breed.	Cross between Short- horn & Hereford Heifer.	Kerry Cow.	Dexter (Irish) Cow.	Brittany Cow.	Dutch Cow.	Dutch Cow.
Water ...	84.97	85.97	86.31	85.91	85.48	87.35	87.43	87.65	85.96	86.36	88.72	88.22
Pure butter fat ...	5.57	4.74	4.40	3.93	4.86	4.15	3.72	3.73	5.34	4.19	2.27	2.40
Casein ...	8.73	8.51	8.55	9.43	8.79	7.79	{ 3.12 4.97 }	{ 7.95 }	7.91	8.76	{ 2.69 5.61 }	2.87 5.82
Milk sugar ...												
Mineral matters (ash)	.73	.78	.74	.73	.87	.71	.76	.67	.79	.69	.71	.69
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Specific gravity at 60°	1.0304	1.0306	1.0336	1.0346	1.0328	1.0286	1.0326	1.0308	1.0304	1.0323	1.0338	1.0344
F. ...	...	...	...	...	...	...	...	...	...	...	...	...
Percentage of cream by measure after standing for 24 hours ...	12	12	11½	11	15	11	9	17	14	5½	6½	9

This was evidently the first attempt at fixing a standard of points for the various breeds.

In order to ascertain the allowance which should be made with respect to the "time since calving," the following "table showing the Daily Average Yield of Milk from 60 Cows during the first 12 Months after Calving" was drawn out. The table was placed at the disposal of the Council by Messrs. Tunks and Tisdall.

No.	Name.	Month.												Daily Average.	During months
		1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.		
1	Victoria, 2nd prize Dairy Show, '78	Qts. 18.5	Qts. 14.5	Qts. 11.0	Qts. 11.0	Qts. 9.5	Qts. 8.0	Qts. 7.5	Qts. 7.0	Qts. 6.0	Qts. 5.5	Qts. 5.0	Qts. 2.5	Qts. 8.83	12
2	Primrose ...	18.5	19.0	17.0	13.0	11.5	11.5	9.5	8.5	8.5	8.5	6.0	7.0	11.54	12
3	Jones ...	18.0	20.0	16.0	14.0	11.0	11.0	8.5	4.5	...	...	...	...	12.87	8
4	Shortlegs ...	16.0	16.0	14.0	14.0	12.5	9.0	9.0	7.5	3.0	2.0	...	...	10.3	10
5	Redford ...	17.0	17.0	14.0	13.0	11.5	11.0	11.0	11.0	9.0	5.0	2.0	...	10.68	11
6	Red Cheeks ...	16.5	15.5	14.0	13.0	12.3	11.0	12.0	10.0	8.0	3.5	1.0	...	10.63	11
7	Paxton ...	16.5	14.5	12.5	12.0	10.0	9.0	7.0	6.0	6.0	...	...	...	10.38	9
8	Champion ...	19.0	15.5	14.5	12.0	11.0	10.0	11.5	10.5	8.0	8.0	7.5	6.0	9.0	16
9	Barry ...	14.5	16.5	12.5	13.0	12.5	12.0	12.0	9.5	8.5	8.0	7.5	7.0	9.0	17
10	Dasher ...	18.0	15.0	13.0	11.5	10.5	9.5	9.0	3.5	1.0	...	...	...	10.55	9
11	Cowslip ...	16.5	14.5	15.0	13.0	12.5	10.0	10.0	9.0	8.5	8.5	7.0	6.0	10.83	12
12	Charmer ...	21.0	16.5	16.0	15.0	15.0	11.0	10.5	9.0	7.5	7.0	7.5	6.0	10.06	16
13	Jones ...	18.5	16.5	15.0	13.5	12.0	11.0	10.5	9.0	7.0	6.5	6.0	5.5	8.64	17
14	Grenade 5th ...	17.0	14.0	12.0	10.0	9.5	9.5	8.0	6.0	2.0	...	...	...	9.77	9
15	Loosley ...	19.5	17.5	14.0	11.0	9.0	10.5	8.5	8.0	7.0	4.0	3.0	...	10.18	11
16	Cockhorn ...	17.0	19.0	17.0	14.5	13.0	13.0	12.0	11.5	8.0	10.0	9.0	7.0	12.15	13
17	Sandwich ...	18.0	18.0	14.0	12.0	10.5	10.5	9.0	9.5	7.5	6.5	6.5	5.0	10.15	13
18	Meadow Flower 14th (d. of 1st pr. Chippenhams)	19.0	20.0	18.0	15.5	13.5	13.5	11.0	9.0	5.5	3.5	2.0	...	11.86	11
19	Hereford (Cox's)	20.0	17.5	17.5	14.5	14.0	12.5	9.5	8.0	3.0	...	...	...	12.94	9
20	Blossom ...	18.0	22.0	19.0	17.0	16.0	13.0	12.0	9.0	9.5	8.0	7.0	5.5	13.83	12
21	Witney ...	19.0	19.0	17.0	14.0	14.0	12.0	10.0	5.0	6.5	1.5	...	...	11.8	10
22	Cherry ...	20.0	19.5	18.0	16.0	13.0	11.5	14.0	8.0	4.0	4.0	...	...	12.8	10
23	Hereford (Cornish's)	20.5	19.0	18.0	18.0	15.5	13.0	11.5	11.5	6.0	...	...	...	14.61	9
24	Tiphorn ...	16.0	14.0	13.0	12.0	11.5	11.0	9.5	7.5	7.0	7.0	5.5	...	10.36	11
25	Hereford (old)	23.0	22.0	22.0	18.0	16.5	16.0	11.0	12.5	12.0	8.0	4.0	...	15.0	11
26	Noble ...	17.0	16.5	17.5	15.0	14.0	12.5	10.5	8.5	8.5	...	...	...	13.33	9
27	Fair Maid (2nd pr. Croydon) 1880	17.0	16.0	13.0	11.0	9.5	10.0	7.5	8.5	7.5	6.5	4.0	...	10.04	11
28	Primrose ...	19.5	18.5	17.0	16.5	14.5	12.5	4.5	...	...	...	...	...	14.71	7
29	Darling ...	17.0	16.0	15.0	12.5	12.5	13.5	12.5	10.5	...	11.5	9.0	6.0	12.04	12
30	Lily ...	17.0	16.0	15.0	12.0	10.5	10.0	10.5	12.5	8.0	11.0	9.5	9.5	10.50	15
31	Champion ...	20.0	19.0	17.0	15.5	14.5	14.0	12.5	13.5	9.5	8.5	...	...	14.4	10
32	Droophorn ...	17.5	16.5	15.0	15.0	13.5	13.5	10.0	...	...	...	...	...	13.0	7

No.	Name.	Month.												Daily Average.	5th month
		1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.		
		Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	
33	Lady	17.0	15.5	13.0	10.5	10.5	10.5	8.5	7.0	...	9.5	7.5	...	11.56	8
34	Bride	...	18.0	18.0	12.0	13.5	13.5	12.5	10.5	10.0	10.5	9.0	5.0	13.09	11
35	Peasant	...	18.0	16.0	15.5	15.0	14.5	12.5	14.5	11.5	10.5	9.0	...	13.20	12
36	Pearl 10th	...	16.5	13.5	12.5	12.0	11.5	8.5	7.5	6.5	6.5	...	...	10.25	10
37	Henrietta 17th	...	16.0	13.0	12.0	10.0	8.5	8.5	5.5	4.5	...	...	...	10.0	9
38	Cornish	...	20.0	20.0	17.0	14.5	15.0	11.5	9.5	10.0	...	...	...	14.68	8
39	Shortlegs	...	22.0	21.0	21.5	15.5	8.5	8.0	7.0	6.0	4.5	...	...	12.1	10
40	Minnie	...	18.0	17.0	15.0	14.0	13.5	12.0	9.5	9.0	6.5	6.5	8.0	10.09	16
41	Infanta	...	20.0	21.0	18.0	14.0	13.0	8.5	7.5	6.0	5.0	...	...	12.00	10
42	Barley	...	19.0	16.0	19.5	18.0	17.0	15.0	11.0	10.5	8.0	...	...	13.65	10
43	Ariel 3rd	...	15.5	12.5	11.5	10.5	7.5	7.0	5.5	5.5	5.0	3.5	...	8.35	11
44	Venus 3rd	...	17.5	16.0	14.0	11.5	10.5	9.5	9.5	8.5	6.5	4.5	...	11.04	11
45	Sandy	...	14.5	15.5	12.5	12.0	11.5	11.0	9.0	7.5	6.5	2.5	...	10.04	11
46	Brindle	...	16.0	13.5	10.5	9.5	9.0	7.5	5.5	4.0	...	...	...	8.88	9
47	Brownie	...	16.5	15.5	13.5	13.5	10.5	8.5	7.0	6.0	4.0	2.5	...	9.36	11
48	Moreton	...	17.5	16.0	14.0	11.5	11.0	9.0	7.0	5.0	...	...	...	11.37	8
49	Cherrywhite	...	18.0	17.5	15.0	14.5	14.0	11.0	10.0	7.0	5.5	3.5	4.0	10.37	12
50	Ruby	...	15.5	15.5	13.5	11.0	10.5	9.5	5.5	...	...	...	...	11.57	7
51	Venus 2nd	...	19.0	17.0	15.0	15.0	14.0	12.5	10.5	5.5	2.5	...	...	10.00	10
52	Minikin	...	19.0	15.5	12.0	12.0	12.0	10.0	5.5	1.0	...	...	...	11.2	9
53	Betts	...	16.0	15.5	13.5	13.0	12.0	11.0	9.5	8.0	6.5	...	...	10.81	10
54	Star	...	16.0	14.5	12.0	13.0	12.0	9.5	6.5	...	...	...	...	12.55	8
55	Dumpling	...	19.0	18.0	15.0	14.0	14.5	13.0	7.5	6.5	3.0	...	...	12.55	10
56	Infant	...	22.5	17.5	17.5	15.5	13.5	12.5	11.0	11.0	7.5	7.0	...	13.31	11
57	Charmer	...	20.0	25.0	25.0	23.5	20.5	14.0	12.0	12.0	11.0	12.5	8.0	17.0	12
58	Stoppis (dam of 1st prize, Islington, 1879)	...	17.0	16.5	14.0	12.0	10.5	9.5	3.5	...	...	...	...	11.06	8
59	Shag	...	21.0	22.0	22.0	20.0	17.5	15.5	12.5	10.0	8.5	7.0	7.5	14.14	14
60	Nancy	...	19.0	18.5	15.0	15.0	12.0	11.0	9.0	8.0	6.5	8.5	5.5	10.92	14
		For 1st month	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.	Daily average over whole period in milk.	Being months
	Daily average of 60 cows—in qts.	18.07	17.09	15.03	13.75	12.55	11.34	9.72	7.94	6.01	4.67	3.05	1.85	11.5	10.83

For this Table the records of the best cows only were selected, such animals being considered more on a par with those likely to enter for a milking competition.

At the 1880 Dairy Show the Milking Trials were conducted in accordance with the results thus obtained, and the following tables indicate the method adopted in awarding the prizes :—

JERSEYS AND GUERNSEYS.—7 ENTRIES, 5 COMPETITORS.

No. in Catalogue	...	...	...	...	59		80		88		89		90	
					Calved Sept. 8	Points.	Calved July 16	Points.	Calved Aug. 25	Points.	Calved Sept. 26	Points.	Calved Aug. 10	Points.
					lb. oz.		lb. oz.		lb. oz.		lb. oz.		lb. oz.	
Weight of Milk given in 24 hours ...	...	...	...	...	30.2	—	16.0	—	19.12	—	38.5½	—	20.14	—
One Point allowed to each Pound for ditto = ...	...	...	...	...	—	30.12	—	16.0	—	19.75	—	38.37	—	20.87
Total Solids upon Analysis ...	...	...	...	...	—	12.93	—	16.62	—	—	—	14.19	—	13.48
Two Points for each one per cent. of ditto = ...	...	...	...	...	—	25.86	—	33.24	—	28.64	—	28.38	—	26.96
Time since Calving after deducting 20 days At one Point for each 10 days = ...	...	...	...	...	29 days	2.9	—	83 days	—	43 days	—	11 days	—	58 days
Total number of Points allotted to each Cow	...	...	...	...	—	58.88	—	57.54	—	52.69	—	67.85	—	53.63

SHORTHORNS.—6 ENTRIES, 3 COMPETITORS.

No. in Catalogue	...	...	...	...	No. 15.		No. 34.		No. 35.	
					No date of Calving given.	Points.	Calved Oct. 1.	Points.	Calved Oct. 10.	Points.
					lb. oz.		lb. oz.		lb. oz.	
Weight of Milk given in 24 hours ...	...	...	...	...	48.8	—	26	—	50.5	—
No. of Points allowed for ditto = ...	...	...	...	...	—	48.50	—	26.0	—	50.31
Total Solids ...	...	...	...	...	12.51	—	13.54	—	12.02	—
Points for ditto = ...	...	...	...	...	—	25.02	—	27.08	—	24.04
Time ...	...	...	...	...	nil	—	6 days	—	nil	—
Points for ditto = ...	...	...	...	...	—	—	—	.6	—	—
Total No. of Points allotted to each Cow	...	...	...	...	—	73.52	—	53.68	—	74.35

DUTCH AND CROSS-BRED CLASSES.—17 ENTRIES, 10 COMPETITORS.

No. in Catalogue	...	...	...	No. 106 Calved end July.		No. 113 Calved Aug. 25.		No. 115 Calved Oct. 4.		No. 117 Calved Oct.		No. 126 Calved Oct. 4.	
				lb. oz.	Points.	lb. oz.	Points.	lb. oz.	Points.	lb. oz.	Points.	lb. oz.	Points.
Weight of Milk given in 24 hours...	...	...	...	40.7	—	43.12	—	41.9	—	43.8	—	39.12	—
No. of Points allowed for ditto =	...	...	...	—	40.44	—	43.75	—	41.56	—	43.5	—	39.75
Total Solids ...	...	...	...	12.31	—	10.99	—	11.21	—	13.28	—	12.13	—
Points for ditto =	...	...	...	—	24.62	—	21.98	—	22.44	—	26.56	—	24.26
Time since Calving ...	...	...	...	70 days	—	42 days	—	nil	—	nil	—	3 days	—
Points for ditto =	...	...	...	—	7.0	—	4.2	—	—	—	—	—	0.3
Total ...	...	...	...	—	72.06	—	69.73	—	64.0	—	70.06	—	64.31
Deduct from No. 113 for deficiency in fat...	...	...	...	—	—	—	6.0	—	—	—	—	—	—
							63.73						

The following Table gives the analyses of the milk of cows competing at the 1880 Show :—
COMPOSITION OF THE MILK OF SHORTHORNS AND CROSS-BRED COW.

	Shorthorns.				Cross-bred.	
	No. 15.	No. 34.	No. 35.	No. 126.	No. 126.	No. 126.
Water ...	87.49	86.46	87.98	87.87	87.87	87.87
Pure butter fat ...	4.08	4.73	3.16	4.06	4.06	4.06
Casein and milk-sugar ...	7.77	8.12	8.31	7.30	7.30	7.30
Mineral matter (ash) ...	.66	.69	.55	.77	.77	.77
	100.00	100.00	100.00	100.00	100.00	100.00
Specific gravity at 60° F.	1.0316	1.0281	1.0316	1.0326	1.0326	1.0326
Percentage of cream after standing 24 hours	11	23½	8½	12	12	12
The morning and evening milk of these cows weighed, in the case of						
No. 15 ...	48½ lbs.	No. 35 ...	50 lbs.	No. 126 ...	50 lbs.	No. 126 ...
No. 34 ...	26 "	No. 126 ...	59½ "	No. 126 ...	59½ "	No. 126 ...

COMPOSITION OF THE MILK OF JERSEY, GUERNSEY, AND AYRSHIRE COWS.

	Ayrshire.			Jersey.			Guernsey.		
	No. 42.	No. 59.	No. 80.	No. 88.	No. 89.	No. 90.	No. 88.	No. 89.	No. 90.
Water	84.42	87.07	83.38	85.68	85.81	86.52	85.68	85.81	86.52
Pure butter fat ...	6.82	3.51	7.78	5.88	5.35	4.45	5.88	5.35	4.45
Casein and milk-sugar	7.89	8.64	8.08	7.64	8.09	8.25	7.64	8.09	8.25
Mineral matter (ash) ...	.87	.78	.76	.80	.75	.78	.80	.75	.78
Specific gravity at 60° F.	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Percentage of cream by measure	1.0276	1.0328	1.0326	1.0288	1.0323	1.0315	1.0288	1.0323	1.0315
Quantity of morning's and evening's milk	20 ³ 25 lb. 2 oz.	13 30 lb. 2 oz.	30 ¹ 16 lb.	20 19 ¹ lb.	15 ¹ 38.37 lb.	15 20 lb. 1 oz.	20 19 ¹ lb.	15 ¹ 38.37 lb.	15 20 lb. 1 oz.

COMPOSITION OF THE MILK OF COWS IN THE DUTCH CLASS.

	No. 103.	No. 106.	No. 108.	No. 110.	No. 111.	No. 113.	No. 115.	No. 116.	No. 117.
	No. 103.	No. 106.	No. 108.	No. 110.	No. 111.	No. 113.	No. 115.	No. 116.	No. 117.
Water	85.92	87.69	87.66	86.59	88.68	89.01	88.79	88.77	86.72
Pure butter fat ...	5.01	3.36	2.67	5.26	2.45	2.40	3.04	2.63	4.38
Casein and milk-sugar	8.46	8.26	8.98	7.46	8.16	7.88	7.55	7.85	8.09
Mineral matter (ash)...	.61	.69	.69	.69	.71	.71	.62	.75	.81
Specific gravity at 60° F.	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Percentage of cream by measure	1.038	1.0302	1.030	1.026	1.0324	1.0291	1.0305	1.0296	1.0344
Quantity of morning's and evening's milk per day...	17 ¹ 23.81 lb.	10 ¹ 40.44 lb.	10 24.75 lb.	10 35.6 lb.	5 ¹ 41.31 lb.	4 ¹ 43.75 lb.	11 41.56 lb.	4 36.25 lb.	12 43.5 lb.

BUTTER TESTS.

The first attempt at carrying out Butter Tests at the Dairy Show took place in 1886, under the designation "Jersey Dairy Test," when 13 animals competed.

The following table gives the results of the first butter test carried out:—

JERSEY DAIRY TEST—OCTOBER 5TH, 6TH—AT THE AGRICULTURAL HALL.

No. in Catalogue.	Name of Cow.	Exhibitor.	Age.	Date of last Calf.	No. of Calves.	Days in Milk.	Milk Yield.	Butter Unsalted.	Butter Ratio.*	Colour of Butter.
			Yr. Mo. Wk.				lb. oz.	lb. oz.		
78	Sunflower (1)	H. C. Smith	6 1 0	Sept. 23rd ...	5	12	61 13	3 15½	15.57	Good.
85	Rosebud (2)	H. A. Rigg	6 1 0	August 6th ...	4	60	80 5	3 5½	24.01	Good.
186	Bilberry (3)	S. Baxendale	2 10 2	August 30th ...	2	36	62 12	3 10½	17.16	Pale.
77	Bonnebelle (4)	James R. Corbett	3 8 3	Sept. 5th ...	3	30	62 4	3 3	19.52	Deep.
92	Little Bee	Mrs. Willatts	5 8 2	Sept. 2nd ...	—	33	67 6	2 2½	31.24	Deep.
221	Candytuft	G. W. Palmer	2 0 2	Sept. 16th ...	1	19	23 13	0 12½	29.88	Pale.
220	Wolesley's	G. W. Palmer	2 2 2	July 2nd ...	1	95	37 14	0 7½	80.80	Very pale.
79	Grisette	A. F. Puckridge	8 0 0	August 20th ...	—	46	73 11	2 9½	28.40	Pale.
82	Hopeful	A. F. Puckridge	3 7 2	Sept. 10th ...	—	25	76 3	2 8½	30.09	Pale.
75	Dorothy	H. A. Brassey	4 7 2	Sept. 4th ...	2	31	40 13	2 5½	17.41	Good.
187	Ringlet	Hon. Mrs. C. Howard	2 10 1	Sept. 14th ...	2	21	61 3	2 13	21.75	Good.
188	Heath	Hon. Mrs. C. Howard	2 8 2	Sept. 24th ...	2	11	61 1	3 2½	19.34	Good.
88	Twilight	Aug. F. Perkins	4 1 2	August 4th ...	3	62	39 0	2 5	16.86	Deep.

(1) First Prize; (2) Second Prize; (3) Third Prize; (4) Reserve Number.

* The "Butter Ratio," i.e., the number of pounds of milk required to make one pound of butter.

(Signed) JOHN FREDERICK HALL, }
G. F. ROUMIEU, } Judges.
E. C. TISDALL, }

October, 8th, 1886.

At the 1890 Show the test was augmented by the introduction of the "Guernsey Dairy Test."

In 1893 a class for Shorthorns was added. At the same Show steps were taken to ascertain the variations in the temperature of the cream at the commencement and at the end of the churning process. Another improvement in the method of conducting the test was the ascertaining of the time taken to churn the various creams.

In 1896 prizes were offered for the first time to all cattle competing at the Dairy Show. Mr. Ernest Matthews (Dr. Ernest Matthews, C.V.O.) took over the important and onerous work of conducting the tests, which duties he faithfully carried out until 1902. In addition to the scale of points governing the award of prizes in this section, the time since calving was taken into consideration, and the scale of points was augmented in 1897-98 by the addition of the "points since calving."

The method of awarding the prizes in the Butter Tests has remained as such since 1898, and so far no practical improvement in the method has been suggested.

A great deal of useful information has been obtained by the carrying out of the tests, more especially as to the churnability of the cream of the various animals competing. In carefully studying the results obtained, it is apparent that the cream of some animals is much more difficult to churn than that of others. This can also be said of breeds. Those breeds yielding comparatively large fat globules as a rule yield milk which is easily churned, while the reverse is also true.

Cases have been met with where it has been impossible to get the cream to yield the butter it contains, even after several hours' churning. This may be partly due to the temperament of the animal, and partly to the feeding. In the carrying out of the tests, those responsible often meet with problems which form an excellent opportunity for research.

5. *Conferences.*—Among the activities of the British Dairy Farmers' Association, one of the most interesting and instructive has been the holding of an Annual Conference of its members. Steps were taken to bring this about in the early days of the Association. The first Conference was held in Cheshire in 1885, and with but few exceptions it has been held annually ever since.

The venue of the Conference has not been confined to centres in the British Isles, but Switzerland, Denmark, Holland, Normandy, France, Sweden, &c., have been visited.

A great deal of excellent work—both from the practical, scientific, and educational points of view—has been accomplished during the Conference meetings in the various centres visited, and the English dairy farmer, as well as the dairy industry generally, have reaped beneficial effects as the result of those visits to different parts of Europe.

In 1928 the World's Dairy Conference pays its first visit to this country, and it is hoped that one of the results attained will be the further advancement of the dairying industry in Great Britain. The British Dairy Farmers' Association are taking a leading place in the organisation of this great and important project.

6. *Other Activities.*—Among the further activities of the Association may be mentioned—

(1) *Chemical and Bacteriological Privileges*, by which members can have milk and other agricultural produce analysed and reported upon.

Among the consulting chemists who have served the Association in this capacity, the name of the late Dr. A. Voelcker and the late F. J. Lloyd may be mentioned. This work is carried out at the present time by T. J. Drakerley, Ph.D., F.I.C., F.C.S.

(2) *Veterinary Privileges.*—The first consulting Veterinary Surgeon appointed by the Association was the late Prof. J. Wortley Axe, who faithfully carried out the duties entrusted to him until 1906.

He was followed by Mr. Sidney Villar, F.R.C.V.S., of Harrow. He remained in office until 1919. Since that date the duties of a consulting veterinary surgeon to the Association has been in the hands of Professor G. H. Woolridge, Royal Veterinary College, Camden Town.

(3) *Members' Botanical Privileges.*—The first consulting Botanist to the Association was the late Dr. William Fream, College of Agriculture, Downton, Hants, which duties he carried out until the year 1907, when Professor J. Percival, of the University of Reading, was appointed to the post.

In conclusion, we wish to reiterate what has already been referred to in this brief account of the history and development of the British Dairy Farmers' Association, viz., that since its initiation the Association has always been faithfully led by those who have had the best interest of the British dairy farmer at heart. The work accomplished by the Association has been enormous. The Council has always been blessed to count among its members men of keen foresight and unwavering energy in the accomplishment of its objects. Methods and organisations, which have now become of national importance, have been initiated by the Association. In this respect mention may be made of the fact that the Association offered prizes for milk-recording as far back as the year 1881.

Dr. Fream read a paper at the 1885 Dairy Show on "Milk Registers." An article from the pen of Mr. Primrose McConnell, B.Sc., on the same subject appears in the 1888 Journal.

Dr. Fream's paper, published in 1885, influenced Mr. McConnell to start "Milk Records," and undoubtedly Mr. McConnell is the oldest and longest recorder in Great Britain to-day.

Since 1888 the matter lay dormant for about 30 years, but was kept going by the late Mr. John Speir with the Ayrshire breed of cattle.

A CRITICISM OF THE NEW HOYBERG METHOD FOR THE ESTIMATION OF FAT IN MILK AND CREAM.

By JOHN GOLDING, D.S.O., F.I.C.,

The National Institute for Research in Dairying, University of Reading.

THERE is no doubt that the mechanical methods of estimating the percentage of fat in milk and cream have been of very great value to the dairy industry.

By greatly increasing the speed, and at the same time, reducing the cost of the estimation, they have made it possible to obtain masses of information concerning the richness of the milk of individual cows. They have also encouraged the production of milk rich in fat by providing creamery proprietors with information on which they can purchase milk on a basis of its fat content.

When first these mechanical methods were introduced, analytical chemists discountenanced them except as very rough tests, on account of their inherent weaknesses due to their dependence on a variable and empirical removal of fat by mechanical means and subsequent necessity for accurate measurement of the fat in tubes which might be far from accurate in their graduations.

Two mechanical methods—the Gerber and Babcock—have, however, proved to be of such value and were so carefully controlled by their original inventors that results obtained by these methods are now accepted in all but legal or very special work in which gravimetric estimations alone avoid the possibility of the sources of error above mentioned.

A very valuable office has also been performed in this country, by the National Physical Laboratory, who undertake to test volumetric glassware used in dairy chemistry, and a like service has been rendered by government departments in other countries.

The Gerber method, which holds the British field gives very reliable results which do not differ more than 0.1 per cent. from analytical determinations. The basis of graduation is that one millilitre * corresponds to 8 per cent. fat, 11 millilitres of milk being taken for the test. The other reagents are 10 millilitres of sulphuric acid and one millilitre of amyl alcohol.

* 1 millilitre = 1 cubic centimetre = 18 drops.

The use of strong sulphuric acid with the resulting heat generated on mixing is undoubtedly a disadvantage, particularly for those unskilled in the use of chemical reagents, and even Dr. Gerber himself endeavoured to replace it by some other reagent. Various alkaline solutions were tried, but as long ago as May, 1911, the author pointed out in a paper published in the "Analyst," that when alkaline solutions were used, the fatty layer does not consist of fat alone, but that the fat also dissolves a part of the added alcohol, and a somewhat complex reaction also takes place which involves the partial saponification of the fat layer by the alkali added. It was proposed to overcome this difficulty by reducing the quantity of milk used for the determination, retaining the graduations originally used by Gerber. The added sources of error and other disadvantages resulted in the abandonment of these methods.

The subject is now revived by the introduction of the "Hoyberg" method which has been modified and simplified by Mr. Bernard Spur of the Hoyberg Company, Limited, of Copenhagen.

The outstanding feature of the Hoyberg method is that the disadvantage of the alcohol-inflated fat layer has been turned to good account in dispensing with the necessity for a centrifuge which added to the cost of all previous methods of this kind. The method is further simplified by the fact that only one liquid is added to the milk.

The liquid is alkaline, and, therefore, much more suited for use on a farm or in a dairy than sulphuric acid. Moreover, the temperature of the waterbath does not exceed 120° F.; a more convenient temperature for handling the butyrometers than that which is employed in processes involving the use of sulphuric acid.

The whole outfit is compact, and is likely to appeal to the dairy industry, more particularly to farmers and to dairymen, who have only occasional tests to make. It also seems suitable for educational purposes.

Trials have been made of this method in the chemical laboratories of the National Institute for Research in Dairying, beginning with the original apparatus introduced by Dr. Hoyberg, and repeated with the modifications introduced by Mr. Bernard Spur, who sent a wooden box fitted for testing milk and cream for a critical examination.

Dr. Norman Wright, who conducted the earlier tests at the Institute, read a paper before the Society of Public Analysts, in which he criticised the principle above mentioned of inflating the fatty layer with substances other than fat.

The introduction of one liquid only, minimised errors due to inaccurate measurement. It is well to point out that inaccuracy in the measurement of the liquid for the Hoyberg test may produce greater errors than inaccuracy in the measurement of sulphuric acid for the Gerber or Babcock tests. It is, therefore, important that both

pipettes should be used with care, and that they should be correctly graduated.

Mr. C. Van Krieken, of Delft, who was working in the laboratories of the National Institute for Research in Dairying at Shinfield, conducted a series of experiments with the new Hoyberg test. He found that the milk butyrometers were correctly graduated within limits allowed for Gerber bottles and that the basis of graduation was the same for the Hoyberg where 9.7 millilitres of milk are taken as for the Gerber where 11 millilitres of milk are taken for the test.

The cream butyrometers are made for 4.4 millilitres of cream and the graduations compare with the Gerber bottles the basis of graduation of which is that 3.333 millilitres correspond to 60 per cent. of fat, 5 grams of cream being taken for the test.

The National Physical Laboratory does not recommend the use of pipettes for measuring quantities of cream.

A series of determinations was carried out on milk and cream of varying percentages of fat, comparisons being made with results obtained by the "Gerber" method and by the "Rose Gottlieb" method of analysis. The results agreed closely both for milk and cream. The fat rose without spinning in a centrifuge in the time recommended by the inventors. Our results are substantially in agreement with those of other investigators of this method.

The details of procedure recommended for this test are as follows :—

To the special butyrometer is added 9.7 cubic centimetres of the well mixed milk to be tested followed by 6.5 cubic centimetres of the special liquid.

The butyrometer is then closed with a rubber stopper, and turned with the stopper downwards to mix the liquids in the container nearest the stopper. Immediately this has taken place, the butyrometer is vigorously shaken 20 times to and fro in a line with its length, after which the liquid should be quite uniform. It is now twice inverted and shaken vigorously crosswise to its length. It is then placed in the water bath supplied at 50° C (122° F.).

After three minutes it is taken out and twice inverted so that in each case the contents run from one container to the other and back again, shaking again lengthwise ten times and crosswise a few times. It is then placed again in the water bath, stopper downwards. After a further three minutes, the butyrometer is again taken out and once inverted without shaking, again being replaced in the water bath, stopper downwards. This is repeated after a further three minutes.

After fifteen minutes in the water bath, the reading is taken. The time in the water bath at 50° C is therefore twenty-four minutes. Six or more butyrometers may, however, be shaken at the same time.

For the determination of the percentage of fat in cream, to the special cream butyrometer is added 4.4 cubic centimetres of cream by means of a pipette (or special syringe for cream with over 20 per cent. of fat). Afterwards, 4 cubic centimetres of the alkaline liquid are added.

The shaking can be reduced to ten times to and fro lengthwise, and the periods in the water bath can be reduced to two minutes each, with eight minutes, instead of fifteen, for the final separation of the fat, making fourteen minutes in the water bath as compared with twenty-four for milk.

The reading is carried out as with the Gerber. Immediately after taking from the water bath the bottom of the fat layer is adjusted to one of the percentage divisions by loosening the stopper.

SUMMARY.

The new Hoyberg method is capable of giving sufficiently accurate results to make it comparable with methods in which a centrifuge is used.

The fact that the fat is inflated with substances other than fat, makes it less reliable by the introduction of a new possible source of error.

The use of a proprietary alkaline liquid makes the method dependent on the makers for further supplies, whereas sulphuric acid can be readily obtained and different consignments do not prejudice the results when the gravity is adjusted.

On the other hand the liquid is much safer to use, and removes a possible source of danger in the hands of young people or those unskilled in the use of chemical reagents.

The time taken is longer than with centrifugal methods particularly if a large number of tests have to be made.

The apparatus is simple and seems to the writer to have special value for educational use and for use by farmers and others in the home or office.

The writer is of opinion that it could not be recommended to replace the Gerber test for milk recording or experimental work.

EGG-LAYING CONTESTS : Their Influence upon modern Poultry-keeping development.

By J. N. LEIGH.

It has been stated by authorities better qualified to give an independent and unbiassed opinion than the writer that laying tests have played an important part in the modern development of the poultry industry, which for business purposes consists mainly of that section which is devoted to the production of eggs and the breeding of productive stock. It would, indeed, be difficult to visualise the development of that industry without the incentive and stimulus afforded by competitive tests, and perhaps the most potent argument in support of that statement is to be found in the fact that whereas laying competitions started in England 30 years ago they have now become general throughout the world. It may be doubted whether the pioneers of the old Utility Poultry Club realised the significance of the work to which they set their hand in launching the first laying competition at Northallerton in the autumn of 1897 (the total entry in which amounted to 28 pullets); but I am glad to learn there are others who consider that it was the most momentous step that has been taken in the interests of poultry-keeping within our recollection.

The success of laying tests can only be measured by the material advantage accruing therefrom to the breeders and to the industry in general. That in turn depends upon the interpretation placed by those breeders upon the tests, and it is to the credit of British poultry breeders that the high purpose of breeding vigorous stock capable of production—and reproduction—under ordinary commercial conditions has never been obscured by the craze for record making; while the competitive element has always been utilised in the interests of industry and not for the sake of sport alone. It is for that reason we, in the present year of grace, 30 years after the first laying test created that preliminary interest in utility poultry which led to the great revival, feel justified in claiming that the movement which has grown to the extent that upwards of 15,000 pullets are competing in current tests in the British Isles is to a large extent responsible for the present position of poultry-keeping as a remunerative branch of agriculture, if not the most remunerative at the present time.

The laying test originated in England, and as an institution it is specially suited to the conditions of this country, where, owing to a climate that is even more exacting than that of countries which experience lower temperatures, it is necessary to breed laying stock

capable of withstanding severe and frequent changes and accommodating itself to the dreary conditions of an English winter. It has been claimed, and with good reason, that the British laying hen is the most adaptable creature in the world; and it is a significant fact—worthy to be borne in mind by those who may be attracted by reports of sensational laying records elsewhere—that British hens have competed with conspicuous success in laying contests in the United States, Canada, India, and even in South Africa, in competition with native bred and Australian stock, despite the fact that during their journey to Port Elizabeth they underwent a seasonal change from Spring to Autumn. These successes of British born birds have been so numerous as scarcely to call for comment; but there is no record in recent years of pullets born and bred in any other country having won a British laying test. That fact is not due to the more enterprising nature of British breeders, but more particularly to the hardy and adaptable character which the British hen has acquired through many generations in which she has been bred to comply with the sufficiently onerous conditions imposed by the leading British laying contests.

Benefit has accrued to the poultry industry in many ways. The laying competitions have stimulated interest in pedigree breeding and they have afforded independent means of testing the results of breeders' operations. They have assisted the successful breeders by giving them valuable publicity, and they have supplied public demonstration of modern poultry-keeping methods which has had a considerable influence in raising the standard of the poultry kept for business purposes in this country. At the same time these tests have afforded opportunity for testing and demonstrating methods of housing and feeding which have materially contributed to increased egg yield during recent years. Apart from the opportunities for competitive participation, the tests have exercised an educational influence that cannot be exaggerated; and far from the purpose having been accomplished, there is evidence of increased demand for more competitions and more comprehensive tests as the poultry industry extends and embraces more adherents. It is gratifying, therefore, to record the excellent work that is being done by the Ministry of Agriculture and the various County Agriculture Committees and Education Authorities in the promotion of county and district tests that are proving a valuable recruiting source for the larger tests. The farmers, smallholders and even the backyarders are given opportunity and encouragement to test their stocks and to participate in a form of competition that has a wonderfully stimulating effect upon endeavour, with the result that the larger national tests are constantly experiencing increased demand upon their accommodation through the swelling of the ranks of skilled breeders.

In the report of a laying test which I managed in 1913-14 at Sedlescombe, Sussex (the forerunner of the National Tests), I stated that the primary object in originating these competitions was to ascertain

the best laying strains in our various breeds of poultry; and, in addition I stressed the value of these contests as educational mediums. First and foremost it has been possible to impress the public with the fact that by working on systematic lines breeders have been able to produce birds of high laying capacity year after year with a remarkable degree of certainty. The average poultry-keeper has been given a valuable object lesson in the fact of heredity in fecundity, and the realisation of the importance of strain in breeding layers has had a potent effect in raising the average egg yield of British stock.

Striking evidence of the effect of systematic breeding is to be found in the evolution of certain breeds under the influence of the pedigree breeder. The Rhode Island Red is a case in point, illustrating the fact that so long as a breed possesses certain natural qualities and affords the right material it can be raised to the highest productive standard through the process of systematic breeding. The Rhode Island Red owes its introduction to this country to the enterprise of fanciers who found it an attractive bird for the show pen; and for many years it was bred mainly for that purpose and was not seriously considered as a rival to those popular egg-producing breeds, the White Wyandotte and the White Leghorn. Nevertheless, it possessed the right material, and when utility breeders took it up in earnest with the express purpose of breeding layers its suitability quickly became manifest. The following figures showing the number of Rhode Island Reds competing in the National Laying Tests since 1917-18, together with the average egg yield in each year, is a typical illustration of the effect of systematic breeding, attended with increasing popularity as a matter of course:—

Year.	Number of birds.			Average egg-production.	
1917-18	44	...	...	117.00
1918-19	35	...	...	155.00
1919-20	155	...	...	152.01
1920-21	191	...	...	148.69
1921-22	203	...	...	150.43
1922-23	256	...	...	157.86
1923-24	321	...	...	168.10
1924-25	338	...	...	166.35
1925-26	244	...	...	175.14
1926-27	479	...	...	168.24

Comparison of the first and last sets of figures in this table affords striking evidence of the rapid effect of a course of systematic breeding. With more than ten times the number of birds we increased the average egg yield by more than 51 eggs, with the result that the Rhode Island Red is now competing successfully with the breeds in which pedigree breeding for egg-production has been practised for a much longer period. The lesson which the public must derive from this is not that the Rhode Island Red, or any other variety, for that matter, is the best laying breed, but simply that any breed possessing natural qualities

that lend themselves to the development of the fecund character can be improved and raised to the highest level of productiveness if strains are bred on the lines that have been adopted with such success in the case under notice. There are other breeds that are coming under the influence of the pedigree breeder with similar results, and in the course of the next decade it is probable that a dozen or more breeds will be competing for the highest honours in the National Test.

I have referred to the laying test at Sedlescombe in 1913-14, and it is interesting to note that 248 pullets competed in that test, whereas in the 1926-27 National Test at Bentley we had a total of 3,197, which I think is a world's record, and is the more remarkable because this was only one of some fifty odd tests (large and small) held in different parts of the country. It is pertinent to ask, therefore, what could have induced breeders to enter such a large number of birds, to pay an entrance fee of 10s. a head (in most cases) and to sacrifice the yield from their birds for 12 months. Certainly the sporting element about the laying tests could not have attracted such an entry, therefore we must consider the business significance. Thanks to the *Daily Mail*, which has supported the National Tests with a degree of generosity that has provided a practical incentive, substantial cash prizes were offered in each section with various cups and special prizes in addition. Yet the main reason for the popularity of laying tests is that they have become as essential to the utility pedigree breeder in his business as Shows are to the breeder of exhibition poultry. They supply him with the only means of demonstrating in public and under independent supervision the laying capabilities of his strain. They provide him with the cheapest form of advertisement, and if his birds are doing well he enjoys constant publicity in a form which must increase his reputation and his business, supplying him with the best material for his Press advertising. That alone is sufficient reason why breeders put themselves to considerable trouble and expense to enter a number of pullets in the laying tests each year, realising as they do that by this means they are giving a public demonstration of the cultivated character of their strains.

To the public in turn the laying tests afford reliable guidance in the purchase of laying stock, and as the general body of poultry-keepers become better informed and more discriminating this factor will exercise more and more influence. There may be some who are attracted by individual records of a somewhat sensational character, to whom disappointment may result from the discovery that one swallow does not make a summer, neither does one good layer make a strain. The public will do well to place reliance upon consistent performance, such as the attainment of a high position by a particular strain year after year, which is the surest proof of good breeding; and it must be understood that winning of first prize in a keenly contested section by no means casts discredit upon the runners-up. It might happen that a breeder never succeeded in securing the coveted gold

medal, though running very close on several occasions; but there could be no more convincing proof of his ability as a breeder and of the excellence of his strain than its consistent position among the leaders during a period of years.

The supposition that laying tests, having achieved so much, have now served their purpose, leaves out of account the main object in stimulating interest in breeding, in affording opportunity for public testing and demonstration, and maintaining a high practical ideal in laying stock. To be of general value and to render practical service to commercial egg-producers the tests must be so regulated as to ascertain the suitability of birds for breeding purposes. It is not so much what a bird lays, but what her progeny produce in future generations, so that laying tests would serve no purpose of permanent value if they did not assist in eliminating the class of stock that is unsuitable for breeding through small eggs or some other defect. For that reason it is becoming more and more necessary to penalise the birds that consistently lay undersized eggs (that is, under 2 oz.). In the National Tests we have adopted a system of scoring that, while making fair allowance for a few small eggs which a pullet may produce when she is commencing to lay, maintains a sufficiently high standard of egg size to afford a guarantee that any bird occupying a high position in the scoring is possessed of the practical qualities desired by the commercial egg-producer. Discounting the scoring value of second grade eggs does not meet the case, neither does scoring by value, since it may be possible in each case for a very prolific layer of undersized eggs to gain a leading position by sheer weight of numbers. There is still some disagreement as to the system of scoring in laying tests; but I contend that it is necessary to keep in mind the importance of maintaining a high commercial standard in our laying stock, since the commercial egg-producer is the natural customer of the pedigree breeder, and if the latter does not produce stock capable of giving 2 oz. eggs, in addition to good average yield he will lose the custom which, after all, is the chief incentive for the exercise of his skill and enterprise.

Mention has been made of the fact that laying trials have afforded opportunity for testing systems of housing and feeding, which have an important bearing upon egg-production. It must not be supposed, however, that experimental work comes within the scope of these tests. Breeders entrust their birds to the care of test managers with the understanding that the birds shall be submitted to a test of productive capacity under conditions that are as favourable as possible, consistent with an equally desirable test of stamina and hardiness. It is a mistake to imagine that competitors in laying tests are kept under exotic conditions and forced unnaturally with a view to inducing them to lay as many eggs as they possibly can, regardless of the consequences. It is obvious that a poultry industry could never be built up on such a basis, and laying tests could not command the continued support of

breeders if they were content to return sensational records and send the birds back at the end of the year in a condition of collapse. To be of practical value the tests must try the physique as well as the productive capability of the stock; therefore, the birds are housed in much the same way as they would be on the ordinary poultry farm, and if the feeding is any better it is only because laying test managers have made a special study of nutrition, and aim to supply in proper ratio the elements needed by a hen to enable her to produce freely and at the same time to maintain her physical condition without loss of energy. In that respect it may be claimed also that laying tests have provided demonstrations and instruction of a thoroughly practical character upon a subject about which the rank and file of poultry-keepers require guidance.

In the National Test at Bentley we have from time to time made departures from regular practice in keeping with modern developments in the poultry industry. For many years laying tests were strictly confined to pure-bred stock, a policy based upon the excellent principle that purity of race went hand in hand with purity of strain. The comparatively modern discovery of the sex-linked factor in crossing, however, introduced novel circumstances and led to modification of our ideas regarding cross-breeds. Sex-linkage gave us the inestimable advantage of being able to distinguish the sexes at birth, and with this practical advance the making of first crosses became sufficiently general to justify the inclusion in the National Test of sections for cross-breeds, both sex-linked and otherwise. Apart from the interest originally attaching to the sex-linked crosses, this departure enables us to throw light on the point whether the crossing of two pure breeds, each bred on pedigree lines, would result in reversion to the comparatively low-yielding character of distant ancestry; and also to what extent we could count upon the theory that out-crossing has a beneficial effect upon health and stamina.

There is no evidence to be deduced from these tests to support the idea that reversion must result from a first cross. On the contrary the individual records and the average production of first cross pullets point very strongly to the fact that where strains have been bred on selective lines for a number of generations the productive trait is so firmly established that the crossing of two breeds does not disturb it. What might happen if further crossing were resorted to cannot be stated, for our interest at present lies only in first crosses. Moreover, the cross-bred birds have maintained a high standard for health and stamina.

With the interest and support of the *Daily Mail* the National Test has made a further departure by providing special sections for farmers and smallholders, which have attracted entries from a class of poultry-keeper that is growing rapidly in numbers and influence. With generous prize money these sections have brought together a representative collection of farm-bred pullets that reflect the improvement

that has been taking place during the last few years. Another interesting feature has more recently been adopted in the form of a section for competitors' customers. The idea is that persons who purchase eggs for hatching or day-old chickens from competitors in the National Test should be given an opportunity to enter some of the pullets they raise therefrom; and the extent of the entry and the excellent yields recorded this season indicate the popularity and admirable effect of this section.

Now that a Laying Trials Committee has been organised by the National Poultry Council, and a scheme has been put into operation for registering records up to a certain standard in approved tests, the usefulness of the laying test—to the breeder and to the public—will become more and more apparent, so that there is good reason for assuming that increased demand for testing accommodation will arise year by year.

THE DEVELOPMENT OF THE ICE CREAM INDUSTRY.

By D. V. DEARDEN, N.D.D., B.D.F.D.,

National Institute for Research in Dairying, University of Reading.

THE manufacture of ice cream is of interest to both the milk producer and distributor because it offers a means of utilising milk and milk products and indirectly increases the consumption of milk. Any means by which this can be attained is to be welcomed.

Ice cream, in spite of its designation, has in many cases had no connection with cream and has been considered a luxury and a product of the confectioner's art. Made, as it should be made, from dairy products with the ingredients blended by the expert maker it ceases to be either a rich confection or a luxury, and becomes an excellent method of including milk in the daily menu.

Much good ice cream is made in England and, as its virtues become more widely known, the demand for it is steadily increasing.

Gradually it is being accepted as a dairy product and it is being more generally realised that as such it needs all the care and hygienic conditions meted out to other dairy produce.

It is possible to make ice creams of differing compositions and of qualities suited to individual tastes and the demand of different districts. To obtain the most satisfactory physical conditions in ice cream it is necessary to adjust the composition of the mix carefully so that the percentage of total solids is within a suitable range and the proportions of the different solids are in the right relation one to another. The milk solids-not-fat, or serum solids as they are termed, can be supplied by using dried or condensed milk both of which can be obtained from surplus milk in this country. The ideal method of supplying milk fat is to use fresh cream, but it is also possible to use butter. Under suitable storage conditions, butter and dried separated milk made during the time of excess supply can be kept without deterioration until required for use in the ice cream mix.

The utilisation of surplus milk for the making of ice cream suggests that its manufacture is a side line for the milk distributor, and in many cases where this method of using milk has been tried it has met with great success. Though the most economic results may be obtained

by large firms with complete machinery and up-to-date means of distribution, yet, there is no reason why the small dairyman should not convert his surplus milk into ice cream. The milk distributor has facilities for obtaining supplies of the dairy produce ingredients and by a little ingenuity in method and organisation of distribution can obtain a market for the frozen product amongst his regular customers.

The question of distribution is one which very greatly affects sales. The regular inclusion of ice cream in the household menu will depend on the ease with which it can be obtained. In districts where a house to house delivery has been inaugurated many families give an order for regular delivery so many days a week. With the modern attractive methods of packaging, and the degree to which it is frozen, it is possible to do this and the ice cream remain in good condition for some considerable time after delivery. Such methods make a very strong appeal to the housewife and bring ice cream into the home as an established article of diet instead of an occasional refreshment irregularly obtainable at considerable inconvenience.

There are many indications of the rapid development which is taking place in the ice cream industry. In 1926 the Ice Cream Association was formed and a recognition of ice cream manufacture as part of the dairy industry was evinced by the holding of the annual meeting at the Dairy Show in 1927. The increase of the number of exhibits of ice cream appliances and equipment at the Dairy Show also shows that ice cream is being accepted as a dairy product and that its production is extending more and more.

A good many of the milk trade journals devote a certain amount of space to the subject of ice cream either in the form of articles on the subject or as a special supplement; one such supplement has now developed into an independent journal, the first of its kind in this country and the official organ of the Ice Cream Association. No doubt within the next few years the ice cream literature in Great Britain will increase to an extent comparable with the development of the trade and put into the hands of those interested, information that will prove helpful in further extending the ice cream business and its conduct on still more efficient lines.

The ice cream literature of the United States of America contains a fund of information relating to ice cream manufacture and to problems and difficulties which the ice cream maker is constantly encountering. Difficulties and problems, new ways and better methods of making and distributing are freely and fully discussed amongst scientific and practical workers, so that the work of the scientist and the experience of the practical worker are combined for the advancement of the industry as a whole.

When reading American ice cream literature one is struck by the number of difficulties which are still encountered, and the amount of research work which has been, and is still being carried on. When

one compares the length of time during which ice cream has been an accepted food in America with the short time it has been accepted here, one realises that the ice cream makers in this country must have many problems and difficulties which they would like discussed and solved. Secrecy and jealousy of methods need to be wiped out and replaced by the system of "the open book." The formation of the Ice Cream Association was a step in this direction, that is, it is a combining together of ice cream manufacturers for the advancement and good of the trade. There will be at its meetings opportunity for interchange of ideas and experiences and help and advice will be available between one member and another; thus knowledge of the ice cream industry will be spread, but there will still be room for instruction in its science and practice at the dairy schools. A certain amount of instruction has been given at the various centres as part of the established courses, but there is a need for short courses during the winter months which could be attended by ice cream workers which would enable them to get an insight into the scientific side of ice cream making. Help is especially needed in the compounding of mixes from a variety of ingredients having different compositions so that the final product is of any desired composition and at the same time the maker is able to take advantage of the market and use any suitable dairy product which is available.

When considering how comparatively rapidly the ice cream industry has developed in England one feels that it will not be long before such classes will be organised and another recognition of this branch of the dairy industry will then be achieved.

PROFITABLE MARKETING OF DAIRY PRODUCE.

By ELSIE G. COOK, N.D.D.

DAIRY farming has been looked on in the past as the most profitable branch of farming in England, but it is a very doubtful question if it pays now with the high expenses of production and low prices for milk. Even if it does pay it gives such a low percentage of profit for the farmer that he only continues to produce milk because other branches of farming are paying no better and milk selling at least brings in a regular weekly or monthly cheque to pay the wages bill with, and it is a certain standby and relief to have these met when due.

Still, he hopes on for better times, when there will be a greater demand for milk or less farmers producing so that the prices given by milkmen would go up.

There would quickly be a lessened production if corn or beef advanced in price on account of labour entailed in milking early and late, Sundays and week-days alike, not a single day's respite in the year. But he must do what he can to help prices till the day comes when the demand is greater than the supply and he will hold the bargaining power, but with the general depression in other branches of agriculture, that is not yet. Though the margin between surplus and shortage is not great, produce 105 gallons where only 100 is required and a glut soon accumulates, but produce 10 gallons less and there is a shortage, and dairymen are hunting about for milk to supply their customers and up go the prices.

Every year the question of prices for milk contracts crops up, and in the fight between Farmers' Unions and Wholesale Milk-sellers, the latter nearly always come off the best. Not only is the milk price for both winter and summer milk low, but it is usually made still lower by only a part being paid for at full rates, the rest being paid for at factory rate (a lower price), or a deduction is made on prices paid in summer when quantities exceed (beyond a certain margin) those supplied during the scarce winter months. All this tends to make prices unremunerative, but the dairyman contends that if he has to buy milk, he does not want in the plentiful times to convert his surplus into cheese, butter, or dried milk.

There is not much scope for individual bargaining, though I know that both wholesale and retail dairymen are glad to have and *to hold* a farmer who can be depended for sending up a fairly regular supply of good clean well-cooled milk with long-keeping qualities; such farmers may sometimes get a better price.

Now, if the farmers or their representatives on the Farmers' Union were only able to say "We will send a fairly even supply all the year round" they would be able to get a much better contract price than is at present obtainable. Another thing, too, when there is a shortage of milk the wholesaler supplies the milk from his creameries (where he has bought the milk at factory prices) and supplies the retailer at enhanced rates. He contends, and with justice too, that he has to keep these creameries running with big expenses, but what I would like to say is this: could not a good deal of this money go into farmers' pockets, where it is badly needed?

It has been suggested that the farmers start creameries or factories on their own to deal with surplus milk, but creameries are expensive places to build and equip, and few farmers have capital to invest even if they would pay, which is problematical, for they need very efficient management, and farmers are not usually keen business men—they have not had the training. They are better producers than traders.

There is another way the farmer could help the situation and that is by keeping his surplus milk at home and dealing with it there.

Why don't the womenfolk of the farms come to the rescue?

Just turn all this liquid milk into butter and cheese instead of flooding the market and keeping down prices. Their mothers and grandmothers used to do it, and surely with all the benefit of County Council Dairy Instruction and Dairy Schools they, too, can turn it into good butter and cheese, else what advantage is it to spend all this money on dairying education.

As to plant, there need not be a lot spent on expensive utensils for most farmhouses have lying idle in their dairies, churns, milk leads or bowls, vats and presses, which could be put into use again.

Good English butter is always saleable, butter that is sweet and nutty, cuts firm to the knife and breaks off short, instead of the greasy butter the creameries here usually blend and send out.

Calves, pigs and poultry will flourish on the skim milk, but the big standby is cheese, for good quality cheese is always saleable.

Cheddar or Cheshire for large dairies, Loaf Cheddar, Caerphilly or Stilton for smaller ones, or the various soft ones will come in handy for using up the smaller quantities: even a couple of quarts of milk should not be wasted but turned into a cheese.

How is it that soft cheese is not more generally made and sold here, why cannot our dairymaids produce tempting palatable soft cheeses such as are obtainable in France? These cheeses are easy and simple enough to make, yet English dairymaids don't seem very successful with them, either they make them hard and chunky, far from being the creamy texture they should be, or, if soft, of a bad flavour, tainted with dirty milk or too slow drainage, or else unripe with whey running out when sent to show or market. What I have found from experience the majority of English people like best is a

soft mild creamy cheese, say of Camembert variety just when the white mould has formed like a coat of velvet, then the acidity has dispersed and the curd changed into a soft creamy textured cheese, then, too, it is at its most profitable stage to sell as it contains a high percentage of moisture. I believe there is a ready sale for such cheese everywhere in England if they were obtainable.

I can speak from experience. I have lived on a farm all my life, and had a retail milk business, which grew up from my parents' farm and which I managed for over twenty years.

A hundred gallons of milk, more or less, was retailed daily, and never a quart was allowed to go sour or waste. Every afternoon all surplus milk was brought to me and turned into cheese. If a fair quantity I usually chose to make it into a Stilton as, though it entailed more work, it was longer spread out and I could use two days' curd for one cheese. Sometimes when I was getting short of vats I made Loaf Cheddar, using my Stilton moulds and a homemade leverage press. With smaller quantities of milk and always once or twice a week when I had milk to spare, during the summer months I made soft cheese to meet my customers' requirements, not made to exact formula, but generally of Camembert type, though sometimes of Pont-le-Eveque, especially when the weather was colder; temperature and other factors governing type.

I bought no appliances except a few Stilton and soft cheese moulds, and always had a ready retail sale for all three types of cheese, and though I was handicapped in many ways, I managed to secure prizes at "Royal" for all three kinds.

Clean sweet milk is necessary for soft cheese and not too much rennet, and when the weather is cold I have found a cupboard where the hot water tank or pipes from kitchen range pass through a good place to drain them as they must not be chilled.

A few lessons followed by the knowledge only to be gained by practical experience ought to enable anyone to turn them out profitably. I used to charge at about the rate of 1d. per ounce, more if a ripe Camembert, and I considered I used to realize about the same price as if the milk was sold retail. Of course I had the work, but then I had the satisfaction of making good use of surplus milk and never having any stale milk about.

I often think what a waste of milk goes on yearly by retailers in towns over surplus milk, as it is almost impossible to gauge exactly your customers' requirements, you must keep a working quantity; especially at beginning of the week is there a surplus.

Not only must goods be well produced or made, but well marketed, or it will not produce best prices. When you have had experience of buying from the English farmer you recognize how much he lacks in this respect. How often eggs are sent in dirty or not reliable as to freshness through careless looking up, whereas it is quite easy to thoroughly hunt them all up, never selling a doubtful one from a stray

nest, for freshness is the essential quality in a new laid egg. If they come in dirty wipe them clean at once with a damp rag, only if very dirty wash them. Very small or very large ones keep for home consumption, this helps to keep an even sample.

As regards butter there is much room for improvement in making up and marketable appearance. In judging butter at agricultural shows I find quality usually much better than appearance. There seems to be no standard shape for bricks, they are all shapes and sizes, some are short and dumpy, others too long or sloping away at ends. Why don't our dairy schools or shows fix a standard size or shape?

I suggest an oblong brick with equal sides, the length to be double the width and height which are equal. These will fit well together for packing like a parquet floor. A neat pattern on the top is an added attraction, each pound or half-pound being wrapped in grease-proof paper.

If only each farmer or every member of a farmers' family will do his best to work hard for the common good, farming in England may still survive to see more prosperous days.

REMINISCENCES OF THE B.D.F.A. PRIOR TO 1900.

By PROFESSOR JAMES LONG.

SPEAKING from memory I believe that I visited the first Show held at Islington. It was a new event in London and I felt compelled for two reasons to go. First was the fact that, as a youth, I had a relative living near by, and when visiting him I remember witnessing the great open space upon which the Agricultural Hall now stands being cleared, and building operations commenced. Next came a thirst for knowledge about butter and cheese manufacture. I had made a few trips abroad, to France, Switzerland and Belgium, but my first trip led me to visit the markets in which numbers of women were selling their wares, the products of *petite culture*. I purchased some soft cheese, probably Camembert and Bondon, and they appealed to me so strongly that on my next visit to Normandy I went direct to the descendant of the inventor of the Camembert (Marie Harel) who was a prominent maker. Such are some of the small things that make or mar the career of one's life.

At the first annual meeting I attended, as a new member, I ventured to propose with much temerity that the subscription for tenant farmers should be reduced to 10s. 6d. This enlisted the support of Mr. Tisdall, who was justly regarded as a father of the Association, and it was carried. Mr. Tisdall was head of the old Kensington firm of Tunks & Tisdall, but there was no Tunks in my recollection. His son Alfred who, like himself, suffered from the most terrible of all diseases, was the manager, and he subsequently became director of the arrangements of the Showyard at Islington. He did excellent work for some years, even after the drastic operation which he underwent. My later position, as Chairman of the Show Committee, was largely due to Alfred Tisdall's advocacy. He came down to my country home and persuaded me to stand as a candidate. I assumed that, as a matter of course Sir George, then Mr. Barham, was as the senior member the proper man for the post, but the Council thought otherwise, and I was installed in a position which I had never contemplated, and there I remained with the generous support of my colleagues for some years. The chairmanship demands several qualifications—robust health, for the Show which I seldom left from 9 a.m. until 8 p.m. makes great demands upon time, strength, and knowledge of the work, ability to preside at the meetings in the Showyard, as well as at the offices at which one is always liable to be elected

Chairman, and not the least important—to be well fortified with information in relation to the dairy industry in all its branches. I never enjoyed robust health, and often nearly broke down, but if I dare venture to say so, I had made a study of the subject which enabled me to hold my own against all opponents of what I believed to be right. I had many opportunities of nominating Members of Council, not one of whom was a failure, and still more of judges of produce and stock.

I was elected Member of the Association in September, 1878, on the proposition of Mr. Holmes Pegler, who is still an active Member of the Association, and I suppose the only man who has devoted 50 years of his life to its service. The members were good enough to elect me as a Member of Council in 1882, two years before Mr. W. C. Young succeeded Mr. Morrison as Secretary.

The first Show I visited was about 1877. I remember it better by the pyramid of Stilton cheeses in the centre of the Hall, which reached nearly to the roof, exhibited by Mr. Thomas Nuttall, who died in 1926, at the age of 90. He was a dairy farmer and brewer, and no man enjoyed a ride to hounds better than he. I had the advantage of staying with him at Beeby Manor, not far from Leicester, and joining him in driving round his farm in a pony cart in which he always carried a few tools to mend a broken gate or fence if necessary. Mrs. Nuttall was the most famous of all female cheesemakers, and it was through her kindness and demonstration that I learned the intricacies of Stilton cheesemaking, which subsequently served me so well. I believe Mrs. Nuttall was the Lady of the Manor.

At the time I joined the Association, the Secretary was Mr. Morrison, the Consulting Chemist Dr. Augustus Voelker, an able and wise old gentleman, Professor Wortly Axe, the Veterinary Adviser, and Mr. Raffety, the Manager of the Agricultural Hall. Professor Axe, who was a scholarly man, spoke seldom, but was remarkable for his somewhat pedantic mannerism. He was a thorough gentleman and head of the Veterinary College; and did me more than one great kindness. The offices were on the first floor above a well-known stationer's shop in Fleet Street, the corner of Chancery Lane, near where Temple Bar was then standing. When Council and Committee went out for lunch, some went to the old coffee house on the other side of Fleet Street, while others preferred a tavern near by. The former provided a special menu for barristers, the coffee being then perhaps the best in London. Among the earliest Members of Council whom I remember were Mr. E. C. Tisdall, Mr. J. Welford, Mr. Alexander, Mr. Stapleton, Mr. Geo. Barham, all largely engaged in the milk business, Mr. Holmes Pegler, the only member living, and one who is likely to render great service for years to come and who is still a goat enthusiast, Mr. Thomas Nuttall, Mr. Dunlop, who delighted to pour oil on troubled waters, and Mr. G. F. Roumieu, a barrister and coroner for a division of Surrey, who was a remarkable character,

and when one knew him a thoroughly good fellow. Mr. G. Mander Allender, the able director of the Aylesbury Dairy Company, could not be induced to join the Association in an active capacity, although he would have proved of great value. Mr. Allender aimed higher and became a Member of the Council of the R.A.S.E., where I believe he was the means of introducing the red Tamworth pigs in the prize list. Mr. Allender asked me to assist him in valuing the estate near Horsham which his company purchased, subsequently selling it, as it did not answer the required purpose of providing milk for the A.D.C. to the Bluecoat School. He met with a violent death in the Riviera, where he was murdered ostensibly for the belt of gold coins which he carried upon his body.

Mr. John Welford seldom spoke, but was a capable business man, branches of his business now existing in all parts of the London suburbs. Mr. Alexander, a keen little man, was a good judge of dairy cows for the London trade, possessed a good business in the East End. Mr. Alfred Stapleton owned a first class business at Stoke Newington, keeping cows in a shed in a most cleanly manner. I saw him, I believe it was, the day before he died. He appeared to have no idea of the nearness of his end. He was a most useful member of the Council, and a regular attendant. We frequently crossed swords, but were the best of friends to the end.

Mr. Barham was the pioneer in modern London dairying. By his great capacity and assiduity he constructed a business which was of marvellous proportions. It was through his energy that many thousands of the Laval Separator were distributed throughout the British Islands and India. The Dairy Supply Co. and the Express Company, so well-known throughout London, were his work. No man probably lived a more strenuous life. He became Mayor of Hampstead, and fought a constituency for Parliament in 1895, but although he was not successful he was honoured with a Knighthood, and later retired to Snape, his old-world seat on the borders of Kent and Sussex, where he entertained the British Dairy Farmers' Association Conference party a few years before he died at a ripe age. He was succeeded by his sons, Col. Arthur Barham and Mr. Titus Barham, perhaps the wittiest Member of the Council in my time, and one who inherits the ability of his father. Sir George was my colleague as delegate to the Central Chamber of Agriculture, but he seldom attended. I fail to remember the years in which Mr. Rigby, Professor Carroll, Primrose McConnell, who still lives, but attends no meetings, joined the Council! Mr. Ashcroft too was a most efficient member, but he too is living in retirement after a busy life. Of Mr. Palgrave Page I have nothing to say but what is complimentary. On many occasions when great difficulties arose, Mr. Page quietly took the matter in hand and pushed it through. He is still in good health and looks as young as he did 20 years ago. The Council showed their appreciation of Mr. Page's work by placing him with Mr. Titus Barham

on the list of Vice-Presidents. Among other Members of Council were Mr. Ross and Mr. Wm. Vosper, a large landowner and farmer near Plympton in South Devon. I had the privilege of spending ten days with him many years ago, and I believe him to have owned the finest dairy herd of large cattle (South Devons) that I have ever seen. There were two dairies to which the milk of the 200 cows were sent for scalding for the production of clotted cream for sale in Plymouth. It was practically the only dairy of the size and character in England.

I have not spoken of Mr. W. C. Brown, who farms largely near Appleby in North Lincolnshire. After a long series of years he still attends to steward the Working Dairy. He has joined many Conference parties, and is a general favourite as a prince of good fellows usually is. Another member who, getting into years and still hunts with regularity, is Mr. Robert Long, of Stondon Manor, Beds, and owner of a nice estate. I first knew Mr. Long when he was almost a youth, slight and fragile. Horseback has made him a new man, if a little rotund. Like other old hands he is taking it easy, and leaving the management of his farm to his son Captain Long. Captain Oliver Bellasis is another hunting enthusiast, who took up farming after leaving the Hussars. What he has done he has done well, but I am speaking of men who are getting, unless they have already reached that period in life, into the sere and yellow leaf. I come last to Mr. Samuel R. Whitley, who, in my judgment, has done more than any other man to make the Association what it is, popular, and with a good balance at the bank. I shall not say more of Mr. Whitley, who is the present Chairman of the Show Committee, for he would, as a modest man, probably cause it to be deleted.

Among the improvements which have been made during my active membership, I may mention the erection of the bandstand and the Working Dairy, of which it is the centre. The band is situated above the stand, and practically plays in the centre of the Hall. The Association invariably selects one of the best military bands connected with the Army. It is a great attraction at those hours when it can be satisfactorily heard, but this is not always, the hum of the voices of thousands of people and the bellowing of the cattle preventing it. The buttermaking competitions, which are eagerly watched by large number of visitors—payment being charged for seats in the ring—originally took place in the cold and cheerless apartment on the left of the main entrance to the Hall.

An interesting addition to the programme was the introduction of a piggery in what I believe is known as the Gilbey Hall. It was not a success, and was abandoned. Another item of interest was the decision of the Poultry Committee or the Council to test the edible quality of pure and cross-bred birds. Mr. W. B. Tegetmeier, who was then living at the age of 95, was one of the most active supporters of this movement. He as vigorously denounced most of the varieties

of pure bred poultry as he had for years denounced poultry farms which are now so great a success, his idea being, if I am not mistaken, that the only good table fowls were the crosses between the Indian Game and the Dark Dorking. The birds were cooked and those of us who were present were able to sample any variety or cross placed upon the table. Opinions varied and I believe that the whole thing was a fiasco with nothing determined, and it was naturally never repeated.

On another occasion I suggested that examples of model dairies as seen in France, Denmark, and I think Switzerland and Holland, should be constructed, and the work of converting milk into butter or cheese demonstrated. As this was a costly affair I asked my friend, Mr. James (later Lord) Blyth, the well-known breeder of high-class Jerseys, and the owner of the Model Dairy at Blythwood, if he would bear the expense. This he was willing to do and the exhibits were regarded as a new feature in the programme, but there was no warrant for a repetition of the expense which would have had to be borne by the Association. On one occasion Mr. Nordenfeldt, the inventor of the famous gun, exhibited a machine which produced butter directly from milk. This, however, was more curious than practical, and I never heard what became of it.

One of the most significant examples of the work of the British Dairy Farmers' Association is the contest between dairy cattle for the cups and other prizes offered under various conditions for the best milkers. Among the first of these coveted prizes are the Barham and Spencer Challenge Cups. Mr. Spencer, who is since dead, was a Member of the Council, and in making this decision, decided not to offer it for the best or richest milker, but for the best all-round dairy cow, *i.e.*, the best milker, the winner in the butter test, and the best looking cow from the point of view of the Shorthorn. Clearly the cow which is of the greatest value to the dairy farmer is the animal which produces the greatest yield of the richest milk. It is of great importance that such a cow should be as perfect a Shorthorn as possible, but it is extremely rare that such a cow appears at Islington or at any other exhibition. The number of cups and medals awarded in my active days was surprising, but since then the number has increased amazingly, and one has only to attempt to wade through the catalogue and the Journal of the Association to learn how prosperous it is, and how great is the influence which it exerts on the agriculture industry. It is to be hoped that in time to come the work of the British Dairy Farmers' Association will be recognized by the King, and that he will be induced to visit the Show and witness for himself what is being quietly accomplished by a body of men who have accomplished more for the industry they represent than any other organization in the country.

I now propose to outline the best of the series of Conferences which have been so largely attended by Members of the Association, and in some cases by their wives and other members of their families.

The most popular have been those which were held in Switzerland, Normandy, the neighbourhood of Paris, when Grignon College was visited, Denmark and Sweden, the Channel Islands, Scotland, Ireland, Cornwall, and various English counties. In my judgment the members enjoyed the Swiss Conference most of all those in which I took part. As Chairman of the Conference Committee, Mr. Rounieu suggested that I should accompany Mr. Young, the Secretary, to make the arrangements, as I had the advantage of knowing the country and speaking the languages employed in French and German Switzerland. At Lucerne, we all stayed at the Hotel Nationale, and great was the astonishment of most of our party on the morning after our arrival at the scene presented by Pilatus and the Righi, the two famous mountains of the districts. We visited Zurich where the late Dr. Nicholas Gerber, who established the now famous *Zürcher Meierei*—the great Zurich Dairy—gave us the best possible advice and assistance in arranging for a Conference which was largely attended by the German-speaking Swiss of the district. At Berne we were heartily received by the leading and most popular man in the city, who subsequently conducted us to a country village where we met the dairy farmers of the district in their quaint holiday costumes. Lunch was provided, some of the most famous *Emmenthaler* cattle were led out for our inspection, and before leaving the National Anthems of the two countries represented was sung with great vigour and intense surprise, as the tunes being the same we thought the Swiss were singing "God Save the King," whereas the Swiss thought we were singing their National Anthem. We subsequently visited the Swiss Dairy School, a few miles from Berne, returning for dinner at the principal hotel where a number of Swiss guests had been invited, including Professor Freudenreich, the then famous bacteriologist, and his wife Madame Freudenreich, an extremely charming woman who spoke English fluently, kindly giving me a few hints in German while I was changing my coat and vest for evening dress for dinner.

From Berne we travelled to Interlaken, where a most enjoyable evening was spent, the late Mr. Jesse Collings being one of the most vigorous among the dancers. From Interlaken a trip was made to the Scheidegg, some of our party riding on horses to the verge of a deep valley into which we witnessed avalanche after avalanche fall from the Jungfrau, Mönch, and Eiger range. Professor Wallace exhibited unusual daring by venturing on the snow, but great as was the risk which he scarcely realised, he came to no harm. This practically concluded the Swiss tour. The only noticeable event on the journey home was connected with the refreshment supply at a small station. A message had been despatched asking for coffee and rolls to be provided for 150 persons *en route* for the coast. On our arrival such a rush was made for the buffet, but the supply of coffee (*café au lait*) was so quickly exhausted that some of our party found their way into the kitchen to the dismay of the staff. It may be noted that the

Secretary, Mr. W. C. Young, was presented with a testimonial by the members of the party at the Hotel Nationale, Lucerne, Mrs. Long handing the money to him with a few words of thanks for the work he had performed.

The French Conference was, though less varied, a remarkable success. My recollection of the action of the members of our party on the two Sundays during which we were away—Paris in one case and Rouen in the other—is that the vast majority acted on the principle that “when you go to Rome you must act like the Romans.” There was little time to see the best of the French Metropolis. Being invited to the Agricultural College of Grignon through the medium of my late old friend René Lézé, one of the Professors there, we met with a most cordial reception. Luncheon was provided in the Hall devoted to agricultural implements of all ages. We sat down to the number of perhaps 250—a French Government official in the chair. As Chairman of our party I was called upon to reply to the toast of, I think, “Success to the British Dairy Farmers’ Association.” I had prepared a few notes, but when commencing to respond I was for a moment lost, and in a flash decided to speak without them. This, I believe, to be the best plan in an emergency. I have omitted to mention our visit to Caen, when a Conference was held in a public building over which the Mayor presided. The difficulty of discussion on this occasion was greater than I remember it to have been. I was invited to sit next to the Mayor in order to assist in the translation of questions and answers, as had been the case in our meeting at Berne. At the dinner in the evening, at the Hotel d’Angleterre, which has since changed hands, the speeches were excellent. Lord Northbourne, Mr. Jesse Collings and a cousin of Sir Wm. Harcourt all spoke excellent French, but all were eclipsed when the gentlemen who responded for the Press was called upon to reply, for his English was almost perfect. With one exception I pass over visits to farms and dairies. In this case a French Baron invited the party to see his ancient home, providing champagne for those who could obtain it. Every bottle was emptied before many of us were aware that the quantity was limited. On our way there we called at the little farm of the man who had gained the Gold Medal for the best sample of butter sent to the *Paris Exposition Agricole*.

The visit to Denmark and Sweden was chiefly remarkable for what was seen rather than what was said. I have no recollection of any Conference at which the views of the Danes and Swedes and ourselves were exchanged. Nor can I dissociate what was seen on this occasion from what I had already observed or have observed since. Sir George Barham was our Chairman, and I have a grateful recollection of his kindness in allowing me to share his private cabin on the steamer, especially as I am a very bad sailor. I have seen so much in Copenhagen, Stockholm, Malmö, Lunde, and the dairy schools and farms within reach, that it would not be difficult to expand this brief account, but it would not concern the British Dairy Farmers’ Association.

The most popular among the remaining Conferences which I attended was in the Channel Islands. At Guernsey a special display of Guernsey cattle was exhibited for our edification, and I recollect no occasion on which I have seen such wonderful cows. We were shown too the system of cultivation of tomatoes, grapes and potatoes under glass. The main feature of the excursions however, was in Jersey, a Conference being held in the Theatre, or what it appeared to be, and a large number of people had gathered together. I had been asked to give an address which, however, was severely criticized, especially by our old friend the late Canon Bagot. I remarked that I had seen calves fed for veal in Normandy for the Paris market upon skimmed milk. This was ridiculed as impossible, but knowing my ground I offered to conduct a party to the farms where I had seen the practice in operation. The result was that about a dozen crossed to Granville, in France, at the conclusion of the Conference, travelling on to Bayeux, Caen and Lizieux and calling at certain villages on the way to effect our purpose. The only member of the party whom I recollect was Captain Oliver-Bellasis, now a Member of the Council. This recollection is enhanced by the fact that he was keen upon antique furniture which was exposed for sale in some of the shops, and curious old jugs which were on sale in the Bayeux market. I am reminded in speaking of Bayeux, that when the Conference was held in Normandy, it was extended to this old town where visits were paid to the famous tapestry and the Cathedral. I mention the latter as pointing to an incident which, I hope, will never occur again. On visiting the crypt a collection was made for the conductor, but on the money being counted it was found to be partly composed of coins of a variety of descriptions, and all practically worthless. The fact was severely commented upon at the time.

We visited butter dairies where the milk was set in a cool dairy in *terrines*, i.e., deep pans of conical shape standing in running water. When the cream has risen hot air is turned on from the adjoining kitchen, and the milk is all coagulated. The cream is then removed, and the terrines taken just as they are to the calves, one to each calf, the quantity being approximately $2\frac{1}{2}$ gallons, which is a day's ration. On this, veal of the finest quality was produced for the Paris market. I need scarcely add that in Jersey we were shown the finest cattle, typical farms and grass culture as in Guernsey.

During our rambles in Normandy we visited some farms famous for Camembert cheese, and in at least one our host produced some excellent wine which we drank to his greater success, as he and his people did to ours.

I now turn to Ireland, where in a subsequent year the Association arranged for an extended trip to the West, which I had previously taken during the famine. We were largely assisted by Canon Bagot, Professor Carroll and I believe by Mr. James Robertson, all of whom

have long since passed over to the great majority. We were taken to Ballsbridge where the famous Horse Show is held, and entertained at a banquet at which were many famous Irishmen, among them Sir Charles Cameron, the Dublin Chief Medical Officer of Health. My own experiences in Ireland as Commissioner for the *Manchester Guardian* forbid my giving any definite plan of our excursions, as I might probably make some mistakes.

I am inclined to place the Scottish trip next in order. I had the privilege of again being Chairman. We visited Edinburgh, Glasgow, near which was Mr. John Speirs' farm, and took the grand tour by the Trossachs. We were everywhere handsomely treated.

I conclude this paper by remarking that the first Conference was held in Cheshire. Others were in the Lake Counties, when among other historic places Brougham Hall was visited, and a luncheon provided by Lord Brougham. The Norfolk Conference was made remarkable by a visit to Sandringham where the late beloved Queen Alexandra and one or two of her daughters came down to the dairy to receive us. One or two ladies of our party, including Mrs. Long, were presented, my wife being carried off by the Princess (as she was then) to be shown her pets. Of the Devon and Cornwall Conference I remember little beyond the fact that we stayed at the Duke of Cornwall Hotel at Plymouth. Last of all, omitting minor counties, I remember going over to Snape, Sir George Barham's country house at the time of the Conference in Kent, illhealth preventing my taking the whole trip. As usual, Sir George treated our party right royally. It was the first occasion on which I had the pleasure and privilege of meeting the late Lord Kenyon.

The position of Dairying in Great Britain and Ireland is almost entirely due to the work of the British Dairy Farmers' Association. Before any attempt had been made in the direction of Instruction, I read a paper before the Members with the object of inducing the Council to establish a Dairy School. I pointed out that some other countries were far in advance of us, especially Denmark, Switzerland and France, that we imported butter from French blending houses, and soft cheese; butter from Denmark, and cheese from Switzerland, Italy and Holland, and that as we had no knowledge of the process of manufacture of these varieties of cheese, and no system of butter production which would enable us to combat foreign competition, it was time that we commenced a vigorous educational campaign. The result was most encouraging. The Council decided to open the first school in Great Britain and selected a suitable place near Aylesbury.

The next move was more difficult to encompass, inasmuch as an instructor could not be found. It so happened that John Benson, subsequently so well known, and more recently a Member of the Council, was living with me as a pupil. I had expressed my opinion to Alfred Tisdall that he was exceedingly capable, with the result that he came

down to my house with one or two other Members of the Council, and consulted Mr. Benson and myself as to his eligibility and willingness to accept the position of Instructor at the School near Aylesbury. We both agreed, and thus commenced a course of procedure which resulted in the *bouleversement* or, shall I say, revolution in the practice of British Dairying. As a matter of fact this small and modest beginning was followed by a removal of the School to Reading, where, as the British Dairy Institute, governed by a Committee of the British Dairy Farmers' Association and the Reading College, large numbers of pupils were trained and awarded certificates of merit which enabled them to bring British butter and cheese-making to the high state of efficiency which it now occupies. I do not think it is the slightest exaggeration to state that the present position of the Dairy Industry is the result of the work and example of the British Dairy Farmers' Association. The scientific side of the subject was, so far as this country was concerned, absolutely non-existent, whereas to-day it ranks with those other departments of science which have but recently developed. John Benson came to me to learn the practical as well as the theoretical side of the subject owing to his presence at a lecture which I gave at Penrith near where he lived, and which induced him to make the Dairy his life work.

I hope that in future years other old members will describe events which have occurred since my retirement from the Council, and that, like myself, they will not be deterred by old age.

INTRODUCTION TO THE REPORT ON THE TOUR OF THE BRITISH DAIRY FARMERS' ASSOCIATION IN SWEDEN, 1927.

By SAMUEL R. WHITLEY, J.P.

ABOUT two years ago I attended a lunch given to a large number of business men in order to introduce to them a Swedish invention designed to give the ordinary householder the benefit of a small cold store without the nuisance of machinery, and found myself sitting next to Mr. M. de Wachenfelt, the Agricultural Adviser to the Swedish Legation in London. We found much in common to talk about, and Mr. Wachenfelt promised to visit Reading to see the National Institute for Research in Dairying. When that visit came off, Mr. Wachenfelt told me of a Swedish friend of his who wished to invite some young English agriculturist to spend some months on his estate in Sweden. Eventually I was able to introduce a personal friend, who fulfilled the conditions, so Mr. Wachenfelt and he went out to Sweden during the summer of 1926.

My friend, on his return, was so enthusiastic about Swedish hospitality and the new things in agriculture that he had seen, that he positively commanded me to organise a party of agriculturists to visit Sweden.

Just at that time the British Dairy Farmers' Association was considering where to hold its annual Conference, and I was authorised to approach Mr. Wachenfelt on the matter. Having done that, there was no room for doubt, he took the matter up with enthusiasm, and most cordial invitations to visit Sweden were received from those who had the power to make our tour a great success—there remained only the dates to fix and the exact itinerary.

It was 30 years since I had been in Sweden and then only for three days, but a very happy memory of that visit remained, more especially of the warm-hearted welcome we had received.

Having told Mr. Wachenfelt of the things a B.D.F.A. party would like to see in Sweden, he and his friends at home had soon planned out the tour that would be most useful to us, and the Swedish Travel Bureau (Haymarket, London) co-operated most heartily.

We made one initial mistake, at first we fixed the dates so as to have Midsummer in Sweden—that is the most delightful time of the year to be in Sweden, but it is the time of National holiday and festivities—that would be ideal for an ordinary party of tourists, but our business

was to see as much agriculture as possible and to visit more especially Dairy Schools, Seed-testing Stations and firms connected with dairying, &c., &c. During a National holiday that would have been impossible and so the dates were altered to avoid Midsummer—June 6th to the 20th in Sweden proved an ideal time for our purpose, and the Clerk of the Weather provided only one really wet day during that period, but the change from one week later had the unfortunate effect of making it impossible for several of our leading agricultural scientists to join us, as they had planned their engagements to suit the later dates and could not alter them.

A party of 37 members of the British Dairy Farmers' Association (as given below) left London for Harwich and Esbjerg on the afternoon of June 6th and were joined by two others in Sweden.

Mr. F. Batho, Mrs. F. Batho, Mr. J. F. Blackshaw, Mr. A. J. Bourne, Mr. F. Bourne, †Mr. F. J. Bull, Mr. W. E. Cole, Miss J. Cox, Mr. J. F. Crosher, §Dr. T. J. Drakeley, Mrs. T. J. Drakeley, Mr. B. T. Dutton, Mr. J. Evens, Junr., Mrs. J. Evens, Junr., Major F. H. Fawkes, Miss E. W. Fleming, Mr. W. Glossop, Mr. R. P. Gould, Mr. G. B. Hony, Mr. A. MacNeilage, Miss M. S. MacNeilage, Miss F. A. MacNeilage, Capt. W. A. Nell, Mrs. W. A. Nell, Mr. J. Nicholson, Admiral Sir Richard F. Phillimore, Mrs. H. Russell-Fergusson, Mr. C. Roberts, Mr. W. Roberts, Capt. G. C. Sankey, Mr. W. R. Sibbald, Miss E. M. W. Sikes, *Miss J. Stubbs, Miss P. Trevelyan, *Mr. S. R. Whitley, Mrs. S. R. Whitley, Capt. W. Wright.

The detailed story of our perigrinations is to be told by others, but as leader of the party, I cannot close without expressing once more our heart-felt gratitude to Mr. Wachenfelt who travelled with us and opened every door, making his friends our friends, translating our humble efforts to thank our hosts into wonderful Swedish orations, and generally seeing to our comfort and instruction in such a happy way that it was the unanimous wish of all our party that our Association should bestow on him the highest honour within its power—this wish the Association carried out most gladly by making him an Honorary Life Member.

To Mr. Wassberg, of the Royal Agricultural Society at Malmö, who took infinite trouble to provide us with such full descriptions (in perfect English) of all we were to see, and to many other Swedish friends, who welcomed us, lent us their cars and spared no effort to make our visit both enjoyable and instructive, we never can express sufficient thanks, but we hope that some day we may have the pleasure of trying to return their kindness in England.

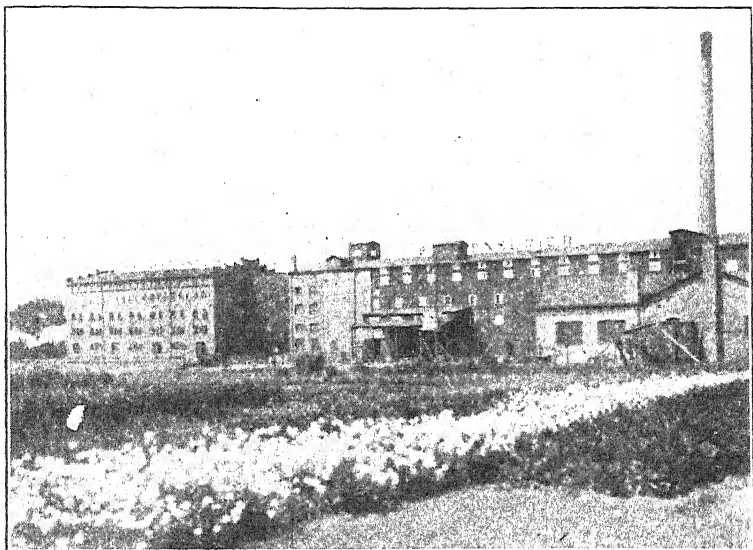
Three points, all making for the extraordinary efficiency of Swedish agriculture, specially impressed me, viz. :—

1. A high standard of live stock is maintained with a minimum of Agricultural Shows by a system of grading breeding stock according

* Member of Council. § Consulting Chemist. † Secretary.

to their proved merits—there we have much to learn—Sweden holds its leading Cattle Shows only once in a period of years and thereby saves large unnecessary expenditure compared with that of our own country.

2. Sweden has given a lead to the rest of the world in its Seed Testing and Growing arrangements. We were told that the Government's expenditure on agricultural science has been returned to the country many hundred-fold. Our visits to Svalof and Landskrona Seed Testing Institutes easily convinced us of the truth of that statement.



Weibull's Seed-breeding Institute, Landskrona.

3. Sweden is leading the world in Pig Testing Stations and Pig Recording.

Further developments along these lines are bound to take place at an early date in our country, and we cannot be too grateful to our Swedish friends for being so willing to enable us to gain by their experience.

The complete programme of the whole tour was as follows :—

Monday, June 6th.—7.42 p.m., depart Liverpool Street Station ; 9.31 p.m., arrive Parkeston Quay (Harwich) ; 9.45 p.m., depart Parkeston Quay (Harwich).

Tuesday, June 7th.—9.45 p.m., arrive Esbjerg; about midnight, depart Esbjerg. Sleeping cars available after arrival of steamer.

Wednesday, June 8th.—7.50 a.m., arrive Copenhagen. Hovedbangaarden. Breakfast at Hotel Terminus, opposite station; 10.0 a.m., depart Hovedbangaarden; 11.50 a.m., arrive Malmö Ferry Station; 12.30 p.m., lunch at Hotel Kramer; 2.0 p.m., depart Hotel Kramer by motor-car for a visit to Alnarp Agricultural College. Return to Malmö. The party will be accommodated at Hotels Kramer, Savoy, &c.; 8.0 p.m., supper at Restaurant Kungsparken in Malmö.

Thursday, June 9th.—Breakfast at Hotels; 8.15 a.m., depart Hotel Kramer by motor-car; 9.30 a.m., arrive Landskrona for visit to W. Weibull's Seed-breeding Institute at Weibullsholm; 11.0 a.m., visit to Säbyholm's Estate and Sugar Beet Factory, owned by Svenska Sockerfabriks Aktiebolaget (Swedish Sugar Beet Factories, Ltd.); 12.30 p.m., lunch at Strandpaviljongen, Landskrona; 2.30 p.m., visit to Bälteberga Estate (owned by Mr. Aug. Kinch); 5.30 p.m., inspection of the Co-operative Bacon Factory; and 6.0 p.m., of the Co-operative Dairy at Kävlinge; 7.0 p.m., supper at Bjärred Seaside Resort (if weather allows); return to Malmö by car.

Friday, June 10th.—Breakfast at Hotels; 9.0 a.m., depart Hotel Kramer by motor-car for visiting farms at Håslöv and Fjärdingslöv with prominent Swedish Friesian Cattle; 11.30 a.m., visit to Simlinge, where Swedish Friesian Cattle, belonging to members of Simlinge Bull Society will be shown; 1.0 p.m., lunch at the Anderslöv Inn; 2.30 p.m., visit to Slättåkra Farm. (Tenant, Mr. Otto Andersson); journey back to Malmö, *via* Börringe, Skabersjö and Torup. If time allows the Castles of Skabersjö and Torup with Gardens might be visited; 7.0 p.m., supper at Hotel Savoy in Malmö.

Saturday, June 11th.—Breakfast at Hotels; 8.30 a.m., depart Hotel Kramer by motor-car; 9.0 a.m., arrive at the town of Lund (Cathedral, University, &c.); 10.0 a.m., visit to Skarhult Estate (the first Ayrshire Cattle Herd in Sweden. Owner, Baron von Schwerin); 11.30 a.m., visit to the Blegel Co-operative Grazing Society (Ardenne Horses and Swedish Friesian Cattle); 12.30 p.m., lunch at Sjöholmen Restaurant; 2.0 p.m., leave Sjöholmen for visits to the Swedish Seed-breeding Institute, the General Swedish Seed Company, P. Bondesson's Agricultural Company, and the Farmers' Sons' School, all at Svalöv; about 4.30 p.m., tea at Svalöv; 8.30 p.m., supper at Hotel Kramer in Malmö; 9.50 p.m. or 10.5 p.m., depart Malmö in sleeping cars.

Sunday, June 12th.—7.4 a.m., arrive at Linköping. Party may remain in cars until 8.30 a.m. Breakfast at Frimurarehotellet, where party will be accommodated; 1.0 p.m., lunch. After lunch Linköping Cathedral may be visited; 2.30 p.m. to 3.30 p.m., by car from Frimurarehotellet to Gerstorp (Swedish-Friesian Cattle) and to Bjällösa (Pig-breeding Station); 3.30 p.m. to 4.30 p.m., visit to Vreta

Old Monastery Church; 4.30 p.m. to 6.0 p.m., visit to Stjärnorp Estate (Owner, Countess Douglas). Return to Linköping; 7.0 p.m., dinner at Frimurarehotellet in Linköping.

Monday, June 13th.—Breakfast at Hotel; 9.0 a.m., leave Linköping by car for Bjärka-Säby Estate (Ayrshire Cattle, Ardenne Horses. Owner, Mr. O. C. Ekman); Noon, depart for Ätvidaberg, where the dairy will be visited. Lunch; 1.30 p.m. to 3.0 p.m., visit to Adelsnäs Estate and Gardens (Owned by Baron Adelswärd); 4.0 p.m., return to Linköping; 5.0 p.m. to 6.30 p.m., visits by car to Bankeberg's Dairy; 7.0 p.m., dinner at Frimurarehotellet in Linköping; 11.10 p.m., depart Linköping in sleeping cars.

Tuesday, June 14th.—8.56 a.m., arrive Stockholm. The party will proceed to Hotels (given later). Breakfast at Hotels. Forenoon free; 12.45 p.m., lunch at the Grand Hotel; 2.0 p.m., inspection of the Mjölkccentralen (Farmers' Co-operative Dairy for distribution of milk in Stockholm); 4.0 p.m., leave Mjölkccentralen by car for Skansen National Park, the way taken *via* "The Scientific Town," the Technical College, &c. Party will be entertained for tea at Skansen by Lantmännens Mjölkförsäljningsförening u.p.a. (Dairy Farmers' Milk Distribution Association). Viewing of Skansen and its open-air Museums; 7.0 p.m., dinner at Solliden Restaurant, Skansen, given by the Dairy Farmers' Milk Distribution Association.

Wednesday, June 15th.—Breakfast at Hotels; 10.0 a.m. to 12.0 noon, visit to the establishment of the Aktiebolaget Separator at Stockholm; 12.15 p.m., lunch at Restaurant "Piperska Muren," given by the Aktiebolaget Separator; 1.30 p.m., depart by car to Hagelby, the country seat of the late L. M. Ericson, and then to Aktiebolaget Separators Foundries at Tumba; 4.30 p.m., tea at Hamra; 5.0 p.m. to 6.0 p.m., inspection of the Dairy Farms at Hamra. Alfa-Laval Milkers shown in operation; 6.0 p.m., return to Stockholm; 7.0 p.m., party will be entertained for Dinner by the Aktiebolaget Separator at "Mosebacke" Restaurant.

Thursday, June 16th.—8.30 a.m., depart Stockholm by train; 9.19 a.m., arrive Södertälje S. By car to Brandalsund Estate, owned by Mrs. Cederlund; 11.45 a.m., leave Brandalsund by car; 12.12 a.m., depart Södertälje S. by train; 1.0 p.m., arrive Stockholm; 1.30 p.m., lunch at Restaurant "Kungstornet." By boat to Saltsjöbaden Seaside Resort; 7.0 p.m., dinner at Saltsjöbaden. In the evening return to Stockholm by train (every full hour).

Friday, June 17th.—Breakfast at Hotels; 8.0 a.m., depart Stockholm; 12.6 p.m., lunch at Laxå Station; 3.0 p.m., arrive Karlstad. Inspection of Karlstad New Town Dairy; 4.30 p.m., by car to Warpnäs Estate, with Agricultural School. Supper; 8.30 p.m., depart Valberg Halt.

Saturday, June 18th.—1.13 a.m., arrive Gothenburg. Night spent on board s.s. "Patricia"; 11.0 a.m., leave Gothenburg for London (Tilbury).

Alternative Programme for Friday and Saturday, June 17th and 18th.—Breakfast at Hotels; Forenoon free in Stockholm; 2.7 p.m., depart Stockholm for Gothenburg direct. Restaurant car attached; 9.20 p.m., arrive Gothenburg. Night on board steamer; 11.0 a.m., depart as above by s.s. "Patricia."

Sunday, June 19th.—At sea.

Monday, June 20th.—About 9.0 a.m., arrive London (St. Pancras Station).

DAIRYING IN SWEDEN.

By CAPTAIN W. WRIGHT,
Dairy Division, Dept. Agriculture, N.Z.

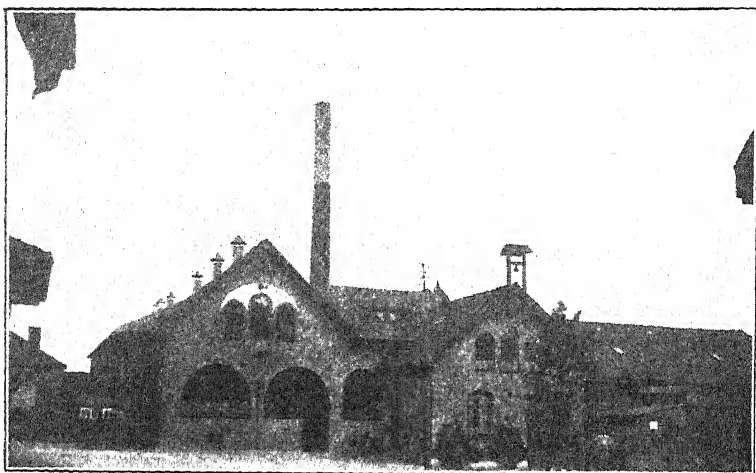
THE types of dairy cattle in general use in Sweden are the Friesian and the Ayrshire. The Friesians seem to do better in the south than they do in the northern part of the country, where the farmers tend to favour the Ayrshire type, the impression being formed that they can withstand the rigours of the climate somewhat better than do the Friesians. So far as the dairy and the manufacture of butter is concerned we found the cow-houses, dairies, and, in particular, the butter factories spotlessly clean. Another point is the great attention that is paid by farmers generally to the recording of the milk and butter-fat production of their individual animals.

The early part of our tour was confined to the province of Skåne, which is the southernmost point of the Scandinavian Peninsular. Formerly it belonged to the Kingdom of Denmark, but fell to Sweden by the terms of the Peace of Roskilde in 1658. The province is at present divided for administration into two counties, or districts, Malmöhus and Christianstad—the boundary lines running diagonally from north-west to south-east. Skåne, both on account of its soil and climate, is the principal agricultural district in Sweden. The whole of the province is not, however, confined to agriculture, and the most important part is a strip of coast land about 12 miles wide in the west and south, and the country around Christianstad. The other part of the province is composed of woods and soil of secondary quality. A remarkable geographical feature is that all the lines of hills run from north-west to south-east. This is connected with a series of dislocations in this direction, by which the strata belonging to the silurian, jurassic, and cretaceous character occur at low levels; so that the present day they appear as extensive plains situated below the mountain ridges of primary rock; these ridges divide Scanian plains into various sections and the character of the plains varies considerably.

At Alnarp is situated one of the two Agricultural Colleges in Sweden. There is a Dairy School for the training and instruction of dairymen and dairymaids. Among the various courses of instruction at these Agricultural Colleges it might be mentioned that there is one special course for the training of dairy experts. This is a course of practical and theoretical instruction in dairying, chemistry, and dairy bacteriology. The above-named course for experts lasts for

one year and makes the students more merited as teachers and organisers than is the case after having only passed the Agronom course. This examination is nowadays required for positions as Government experts in dairying. This expert course is merely advanced instruction for pupils who have passed the Agronom course and examination. At the present time there are no less than six dairy schools in Sweden, the course of which last from six to twelve months.

P. Bondesson's Agricultural Co.—This is a private company the shares of which amount to 900,000 kronor, which is in the hands of the members of the family. The company was formed in 1898, when the property of the late P. Bondesson, M.P., was taken over by the



Dairy Factory, Bondesson's Estate.

company. The land owned by the company in Svalöv amounts to about 153 hectares; besides this the company hires a farm of 250 hectares in the neighbourhood of Svalöv, on which there are good pasture lands. Svalöv butter and cheese-making factories were founded in 1876. At first the dairy operated on a small scale, there being only 40,000 kg. milk per year, but it gradually increased in size from year to year until in the last few years the quantity of milk passing through the factory amounted to 8,000,000 kg. yearly. Besides the butter and cheese factory in Svalöv the company owns cheese factories at several other places.

Atvidaberg.—With reference to the dairy factory on this estate we were able to obtain the following particulars regarding the

working at the time of our visit. The daily supply of milk is approximately 2,000 kilos, and the dairy is under Government inspection. There is accommodation for 12 pupils, six men and six women, who take a six-months' course in the running of the dairy plant and in cheese-making. The price paid by the estate to the farmers for milk is 12 ore per litre. At the time of our visit they were making, in addition to cheese, 400 lbs. of butter daily. Half of the resultant skim milk was made into cheese and the other half returned to the farmer. About 800 lbs. of cheese was made daily, the farmers paying 4/10 ore per litre for the whey which is returned to them, and when skim milk is returned to the farmer the price paid is 1½ ore per litre, but no farmer can take back more than half of the amount of milk he delivered. This is probably due to the fact that a certain amount of whey or skim milk is required for pig feeding on the estate.

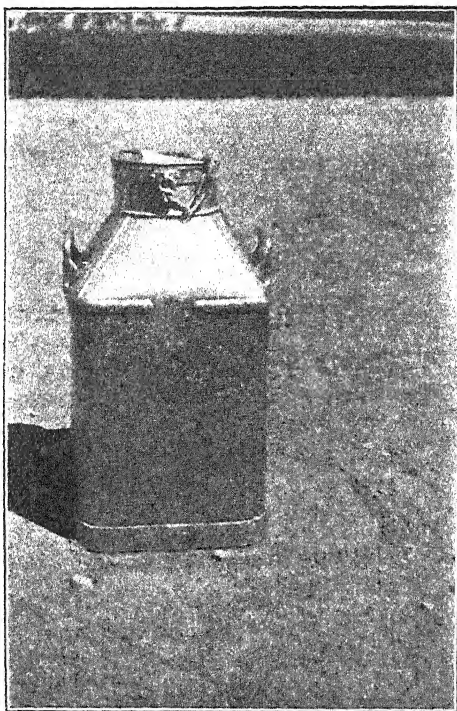
The retail price of milk sold in the town by this dairy is 18 ore per litre, and the prices obtained for butter and cheese at the time of our visit were :—Butter, 2 kronor 70 ore per kilo wholesale ; 3 kronor 10 ore per kilo retail ; the wholesale price for full-cream cheese being 1 kronor 50 per kilo. The average butter-fat content of this full-cream cheese is approximately 30 per cent. A certain amount of skim-cheese is also made here. The reductase test is used, but no bacterial count is taken. At the same time, no milk is allowed to be sold unless pasteurised to 185° F.

In 1880 a dairy was for the first time started in Bankeberg. It was, however, of a very simple type. The farmers of the neighbourhood



Dairy Instructress (in centre) with Cheese made in the Dairy, Atvidaberg.

gradually manifested an interest resulting in the formation of a Dairy Association in 1895. The conditions, however, were not satisfactory, and in 1904 a new Dairy Society was formed and in the Spring of 1906 the new dairy premises were ready. This dairy was principally fitted for the making of butter which, before the War, was exported to the Maypole Dairy Company. When War broke out this export ceased, and since then no butter has been exported. In 1907 the making of cheese was carried out on a small scale; this



Type of Milk Can in general use in Sweden.

industry has increased greatly in the course of time. In order to make use of the whey, butter-milk, and residual skim milk, a pig-house for 120 pigs was erected in 1907 and later on enlarged. It has at present room for 260 pigs. In 1905 this dairy dealt with some 2,250,000 kg. of milk and in 1926 the intake had increased to 5,600,000 kg. of milk. The number of suppliers or patrons of this company at present totals 275. Apparently in the district of Skåne the Friesian breed is in most prominent use by the dairymen. The

foundation of the Swedish Friesian breed of cattle is based on the import of the pedigree animals, partly from Friesland and partly from East Friesland. The importations began as far back as the beginning of the year 1870, considerable shipments taking place about the commencement of 1890. These were chiefly from East Friesland, and in 1904-7 for the most part from Friesland. Since 1907 the importation of females has ceased, only very prominent and specially selected bulls having been imported.

MILK RECORDING SOCIETIES.

The Royal Agricultural Society of Malmöhus includes, amongst other phases of agriculture, the supervision of Milk Recording Societies. The Societies form a very important link in the work of breeding livestock for dairying purposes. This Institute, which celebrates its 30 years' jubilee this year, is organised on the Danish model. The farmers are formed into small Milk Recording Societies. Each Society appoints a Milk Recorder, who himself visits the different farms regularly and weighs and enters the daily milk yield, together with percentage of butter-fat of the different samples. The figures procured by these means are then worked up partly by the various Societies and partly by the Agricultural Society in Malmö.

Milk Recording Societies (Friesian): Of great importance for the improvement of the breed has been the work carried out by the Milk Recording Societies. This institution which celebrated its 25 years' jubilee in 1923 is organised on the Danish model. The farmers are formed into small Societies—so-called Milk Recording Societies—each Society appointing a Recorder who visits the different herds of his Society regularly at certain fixed intervals, usually every three weeks. The Recorder himself weighs the milk yield and tests the butter-fat percentage of each animal in the herd. Besides this, he has to estimate the value of the feeding given to every cow in the herd by means of certain tables for calculation of the feeding value of different food units. The figures procured by this means are then worked up by the Recorder, who, before leaving the farm, must enter them into special forms.

The Agricultural Society in Malmöhus employs a special Live-Stock Officer who has both to check the work and management of the Milk Recording Societies, and to work up the results thus given. The recording year of the Milk Recording Societies commences on 1st November and ends 31st October. Thus the animals' yield of milk and butter-fat is shown by figures for a calendar year (365). The results thus obtained must be considered to reflect the real productive properties of the animals better than the figures frequently used in other countries for the yield in shorter periods. The Scanian farmers

were soon aware of the importance of the work carried out by the Milk Recording Societies. The number of these Societies was increased, and in 1923 there were 94 Milk Recording Societies consisting of 1,376 herds with an aggregate number of 31,338 cows. No less than 35 per cent. of all the cows in the province were recorded that year. The results of this work of the Milk Recording Societies in the province of Malmöhus have since 1904 been made the foundation for the judging of breeding animals. Thus, before a bull can be awarded any prize or entered into the National Herdbook, it is necessary that the dam's average milk yield (occasionally the grand-dam's) either during three consecutive, or, in special circumstances, two recording years, has

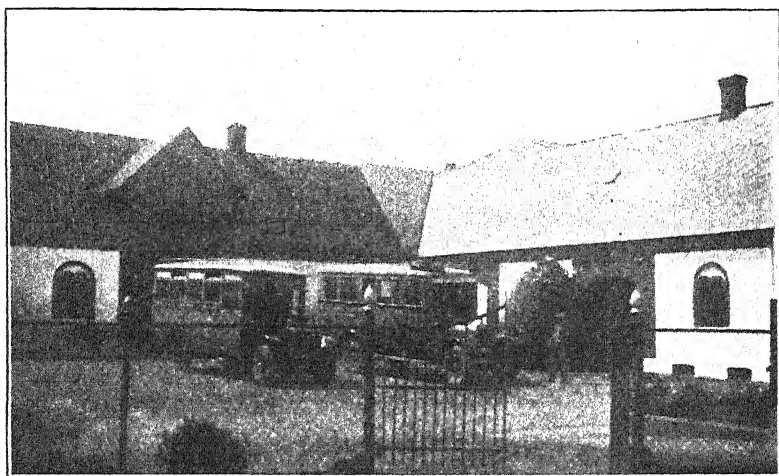


The Home of Mr. Hans Jonsson, Bodarp pr Håslöv.

amounted to at least 131 kilos of butter-fat, with an average fat ratio of the milk during the same years, or at least 3.1 per cent. The requirements applying to the entrance of females in the National Herdbook, and in the Supplementary Register, are that the milk yields of the animals themselves, or those of their dams, either during two, or on the average of three, consecutive recording years has amounted to at least 110 kilos of butter-fat.

From Stockholm a visit was made by motor to Hagalby, the estate of the late E. Ericsson. On this estate there is a most interesting cowshed, where the Swedish cows are in two rows facing each other. In front of their heads is a platform for a cowman to walk on while feeding them, and the hay is brought in by an overhead conveyor from which each cow's rack can be filled with ease. The particular

feature of this cowshed is the system of ventilation adopted, which is, I think, unique. A large cowl on the roof faces the wind, and the air is forced down through a pipe which passes in front of the cows. This pipe is perforated at the head of each cow who thus gets a supply of fresh air right to her nose. The foul air of the building is drawn out from behind by four other cowls on the roof which are turned away from the wind. The floors of the building here, as is usual in this part of Sweden, are of wood, wood being used owing to the extreme cold of the winter period. The cows even in June are indoors, although turned out into a yard for exercise every day. All the cattle on this estate are of the Swedish Ayrshire type.



The Farm Buildings belonging to Mr. Hans Jonsson, Bodarp.

I would like just at this point to draw attention to the fact that covered dung houses, some being fitted with overhead tramways for transporting the dung from the cow houses, were seen at almost every farm, and not only at show places, while electrically driven machinery is found practically everywhere.

To those interested in the manufacture of butter the following information regarding the system in vogue in Sweden at the present time may be of more than passing interest.

The number of dairies in Sweden in 1926 were :—Co-operative 683, Farm Dairies 180, Private Commercial Dairies 682, Commercial Farm Dairies (buying also other milk) 110, a total of 1,655. All the Creameries producing butter only are Co-operative : they are governed by a Board of Directors consisting of farmers, who control the business, but, of

course, leave the technical management to a professional dairyman appointed by them, and he engages the staff necessary for running the plant. Private dairies producing only butter cannot compete with the Co-operative dairies.

According to an agreement that is in force the salaries paid to manager and staff of a Creamery are, in general, as follow :—

The manager receives 2,000 kronor a year and 0.6 per cent. commission on the value of all delivered milk. He is also entitled to free residence, light, fuel and dairy products, or, instead of these, a corresponding sum of money. He is paid 1.50 kronor a day in the country and 2 kronor a day in town for the board of each member of the staff. He is entitled to a fortnight's holiday every year.

The staff receive free board and lodging (or a corresponding sum) and wages as follows :—

		Male.	Female.
Pupil, first year	...	30	25 kronor per month.
„ second year	...	35	30 „ „
„ third year	...	40	35 „ „
„ fourth year	...	50	40 „ „
After fourth year :—			
If not theoretically			
trained...	...	60	45 „ „
If theoretically trained		85	60 „ „

In a town these wages are raised 10 per cent. The staff are entitled to one week's holiday every year.

The payment for whole milk to the farmers is based on the percentage of butter-fat content. The skim-milk is returned free of charge, or the farmers are charged from 1 to 3 ore per kilogram. The price of the whole milk varies accordingly, but is mainly influenced by the current quotations for butter. It runs as a rule between 11 and 13 ore per kilogram of milk for dairies in the country.

The creameries run all the year round.

The creameries only accept whole milk delivery. In some sparsely populated districts the farmers may deliver cream, but this practice is rapidly diminishing.

The working expenses vary, of course, according to the size of the dairy. For an average dairy one may count on about 0.7 ore per kilogram milk and the cost for collecting the milk about 0.5 ore per kilogram. An exact figure representing the average cost of manufacture of 1 kilogram of butter is difficult to state.

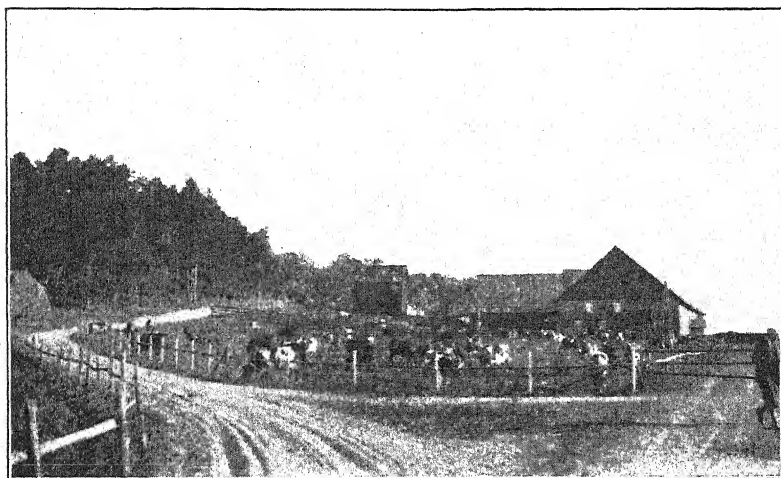
The greatest part of the butter is exported and is sold to the Co-operative Export Associations in Malmö, and a small amount to

private exporters in Gothenburg. The prices are fixed according to the weekly quotations.

In addition to the manufacture of butter, however, there is a certain amount of cheese, of which there are two varieties, made for consumption in Sweden.

There is one feature of Swedish agriculture that attracts the attention of any one who visits the country for the first time, and that is the liberal use of fertilisers that seems to be a common practice in that country. Not only are artificial manures brought largely into use but one is struck by the great attention that is given to the conservation of farmyard manures, both solid and liquid. This, no doubt, has some bearing upon the fine growth of pastures, which appeared to consist mainly of cocksfoot and clover, with a certain amount of timothy, in the south, while in the north rye grass appeared to be more in favour than the cocksfoot which also grew luxuriantly where the quality of the land was suitable.

To give some idea of the dairying system in vogue in Sweden as relating particularly to butter-making, copies of Balance Sheets for the year's operations will be found somewhat interesting, and at the same time illuminating, indicating the amount of milk dealt with by different classes of dairies, and also the average prices received by farmers and also for the manufactured butter. I have not included particulars of the other parts of the Balance Sheets, dealing with stock, depreciation, and cost of plants, thinking that those figures would not be of very great interest to the British dairy farmers generally.



A Farm Steading with Ayrshire Cows, Warpnas Estate and Agricultural School.

COPY OF A LARGE CO-OPERATIVE DAIRY COMPANY'S STATISTICS FOR
ONE YEAR'S OPERATIONS.

Farmers delivering milk during year—650.

No. of these Members of Dairy—650.

Farmers having less than 4 cows—211.

Farmers having more than 30 cows—4.

Total number of cows owned by above farmers delivering milk—
4,171.

		Average price per kilo.
Delivered milk and cream.		
Direct from the farmers—Whole milk	10,070,379	11 ore

The whole milk is used as follows :—

Sold	...	...	...	...	...	37,300	18 ore
Skimmed	...	...	...	...	...	10,033,079	
<hr/>							
Total whole milk	...	...	...	...	...	10,070,379	
<hr/>							

	Average Price.
Products after skimming.	
Cream sold 5,375	2 kronor
Cream used for manufacture of butter 997,933	
Skim milk sold to farmers 9,029,771	1 ore
<hr/>	
Total cream and skim milk ... 10,033,079	
<hr/>	

MANUFACTURE.

						Kg.
Whole milk used	...	...	...	...	...	9,961,413
Manufactured butter...	...	...	...	...	...	380,057
Milk used for 1 kg. butter	...	...	...	...	...	26.2

COPY OF A SMALL CO-OPERATIVE DAIRY COMPANY'S STATISTICS FOR
ONE YEAR'S OPERATIONS.

Farmers delivering milk during year—24.

No. of these Members of Dairy—13.

Farmers owning less than 4 cows—7.

Farmers owning more than 30 cows—0.

Total number of cows owned by farmers—143.

	Kg.	Average price per kilo.
Delivered milk and cream	94,454	
Direct from the farmers—Whole milk	94,454	10·2
Products after skimming.		Average price.
Cream sold	221	1 kronor
Skin milk sold to farmers	all	4 ore

MANUFACTURE.

	Kg.
Manufactured butter... ..	3,745
Milk used for 1 kilogram butter	25
Average price per kilo for butter sold	275 ore

COPY OF FARM DAIRY STATISTICS FOR ONE YEAR'S OPERATIONS.

Farmers—1.

Milk used for 1 kilogram butter—25 kg.

	Kg.	Average price per kilo.
Delivered milk and cream.		
Direct from farm.		
Whole milk	60,000	10 ore
Skimmed milk.		Average price. ore.
Used for feeding of animals	54,000	2

MANUFACTURE.

Butter (from cream)	2,000	250
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COPY OF COMMERCIAL (PROPRIETARY) DAIRY STATISTICS FOR ONE
YEAR'S OPERATIONS.

Farmers delivering milk—300.

Milk used for 1 kilogram butter—26.7 kg.

	Kg.	Average price per kilo.
Delivered milk and cream.		
Direct from the farmers		
Whole milk	8,182,434	13.5 ore
The whole milk used as follows :—		
Sold	99,392	18
Skimmed	6,445,782	
For cheese	1,616,285	
Feeding of animals	20,975	
Total whole milk	8,182,434	

		Average price. kronor.
Products after skimming—		
Cream sold	5,635	2.15
Cream used for manufacture of butter	609,565	

Skim milk—	Kg.	ore.
Sold to farmers	3,278,706	2
Sold elsewhere	22,992	5
Used for cheese	1,702,900	
Used for feeding of animals	553,353	2
Loss	272,631	
Total cream and skim milk	6,445,782	

MANUFACTURE.

Butter (from cream)	241,411.7	315
Cheese	277,490	
Cheese	249,750	127
Cheese	32,471	35

PIG BREEDING AND RECORDING IN SWEDEN.

By W. E. COLE, N.D.A., N.D.D.

SINCE the advent of co-operative dairies in Sweden at the beginning of the present century, separated milk is now returned to the farm instead of being utilised at the dairies; and pig keeping has consequently become of much greater importance to the farmer.

Breeding.—Throughout the whole country there are only two breeds, the English Large White and the Swedish "Lantras."

The objects may be summarised in the following passage, taken from the report, issued in 1897, of a special committee of the Agricultural Society of Malmöhus for the improvement of pig breeding:

"The opinion of the Committee is that one ought to aim at forming herds which combine the size, conformation, rapid growth, and early maturity of the Large White; with the hardiness, muscular strength, prolificacy, and maternal properties of the native breed."

After extensive testing of prominent foreign breeds, the Large White was found superior to all as regards early maturity and the production of bacon of high quality; it was, therefore, adopted as the most suitable breed for the country and for crossing with native stock. Importations since 1890 were mainly from England, and intelligent breeding and selection, mainly at Svalof by the late Mr. P. Bondesson, raised the standard of prolificacy and bacon producing qualities. The former criticism of the Large White, that it possessed poor fecundity and milk yielding capacity, is certainly not now substantiated by an examination of the records of the Svalof herd which for the last 20 years show an average number per litter of 11.06, with the number remaining at weaning time of 8.66, or a death rate percentage during weaning of 20.3.

The Swedish Lantras is derived from the survivors of the original Scanian breed, the best of which were collected in the early days of the present century. Prolific and hardy sows were obtained and young pigs distributed among the farmers, but high-class boars were practically unobtainable. Fortunately Denmark, and to a lesser degree Germany, had taken the lead in this respect some years previously and had succeeded in breeding out many of the undesirable external features, and in hastening the maturity of the native breed. Accordingly, boars were imported from these countries to improve type and quality, and to unite these features with the fecundity and hardiness of the original stock.

Of the two breeds, the Large White is by far the most numerous and important, and Swedish pig breeding methods approximate much

more closely to our own than do those of Denmark. The native Lantras is, however, practically the same as the Danish Landrace which has been used to improve it.

Through the efforts of agricultural societies and prominent breeders, and fostered by the State, four breeding stations were established for Lantras pigs and two for Large Whites; one of the latter being at Skarhult. Boar societies, however, appear to be more popular than breeding stations and arrange inspections and herd book-keeping, mainly among their members. In Malmöhus, no animal from the breeding stations is allowed to be sold without being inspected and approved by the Livestock Officer of the Province. The work of the boar societies has been of the greatest importance and such societies now form a network over the whole country, providing the only possible means for the small farmer to employ first-class boars; since the breeding stations are more suitable for large owners. The influence of these boars is so great that the result is a uniformity of type and an opportunity for the small man to possess as good a herd of breeding pigs as the large owner. When a boar society is formed, a small grant of £5 is made by the district agricultural society, subject to certain regulations, including the right of the Commission for Inspection of Pigs to decide what breed the boar shall be. Sows must also be approved before being granted two "permits of service," which signifies that two service fees of the society's boar will be paid for by the local agricultural society.



Bjällosa Pig Breeding Station.] *[Photo by W. E. Cole.*

Two herd books are kept, one of which is compiled by the District Livestock Officer in manuscript, and is primarily intended to encourage grading up. It consists of four classes, the progeny of inspected,

non-pedigree, foundation sows gradually rising to Class 4 by the continued use of registered boars. For entry in this district herd book, a foundation sow, or subsequent top cross, must pass an inspection test, be of correct type and from a healthy herd. The National Herd Book contains only records of pigs which have been bred from parents registered either in Sweden or in some other country, and of other pigs graded up with four top crosses of registered blood from foundation sows, inspected at each stage. The Swedish Herd Book is, therefore, open, whereas that in Denmark is now closed. The information given includes two generations of pedigree and also details of the farrowings of the animal's dam and both grand dams. Diplomas are awarded to sows specially prominent for good exterior points, consistent prolificacy and good maternal properties. Boars are also judged and classified on a point system. Three grades are recognised and grants of about £3 15s., £3 and £2 5s. are made to the boar society according to the class of boar used.

In 1915 a considerable advance was made by the formation of the Pig Breeders' Society of Malmohus, this being mainly a union of local boar societies and other interested bodies. Prizes are awarded in many directions for the encouragement of pig keeping, breeding, and housing; and auctions of pigs are arranged twice yearly. Research into food consumption and prolificacy is also undertaken, the object being partly to ascertain the profits of pig breeding, and partly the difference between various breeding animals with regard to their efficiency in utilising food.

Excellence and uniformity of type is encouraged by the co-operative bacon factories paying for pigs according to quality, after classification by experts, a graduated price being paid per unit of weight.

Recording.—A very important development has recently taken place, chiefly by the efforts of the Pig Breeders' Society of Malmohus to record the yields of breeding sows. Commencing in 1923 with 17 herds and a total of 2,481 pigs at three weeks old, this number had risen in two years to 70 herds, with 531 sows and 6,497 young pigs. In 1926-27 no fewer than 120 herds were officially recorded and the movement is certainly extending throughout the country, nearly all of the important herds being included.

The object of this movement is to measure the productivity of the sow by ascertaining the pig-weight per litter at the age of three weeks. The numbers per litter at birth and at three weeks, and the average weight of the pigs, variations in weight, sex, and number of teats, are also included in the information collected. The weight of the pigs produced per litter is recorded in respect of each sow, no importance being attached to the yearly production since occasionally sows may have one or three litters. It is suggested, however, that due attention

should be paid to the frequency of the litters when considering the above data. Three weeks is chosen as the best age to weigh, since up to that time the pigs live almost exclusively on their mother's milk, their weight, therefore, being not only a comparative measure of the quantity of milk of the mother, but also of the capacity of her offspring to thrive well. Were they recorded at say six weeks, the weight of the pigs might be considerably influenced by the methods of feeding, and while indicating capacity of the youngsters to thrive well, would give no accurate comparative measure of the maternal qualities of the dam.

The fertility and lactic capacities measured as above described must be regarded as dependent on hereditary dispositions which will be inherited by a certain proportion of the offspring. Fertility as measured by the average number of pigs at birth is a very inefficient means of determining the value of a sow. In the absence of information regarding the size of the pigs and the capacity of the mother to rear them, one may be proceeding along unsound lines and actually selecting animals of poor maternal qualities for future breeding. An illustration of two cases is interesting :—

Sow.	Litter No.	No. of Pigs.	Weight of Pigs in lbs. at 3 weeks old.		
			Total.	Average.	Variations.
Svalof Jeralda ...	IV	9	134.6	15.0	9.9—17.0
Jolanta ...	IV	9	73.2	8.1	7.0—11.4

Thus, the actual productive capacity of one sow is nearly double that of the other, although birth records alone would show them to be of equal merit. It is essential, therefore, that sows should combine those qualities of fertility and heavy lactation which will yield the greatest ultimate pig-weight. It may be objected that the weight of pigs alone may not truly reflect the capabilities of the sow, since young pigs may die from inefficient feeding of the mother, or from disease, or cold. These factors, however, can be eliminated to some extent by reasonable treatment, and in any case have little to do with hereditary qualities. The fact that weak piglings should die off, whatever may be the cause, is itself a factor suggesting that the constitution of the sow may be in some way responsible. As noted above, variations in weight are recorded: this is considered to be important since a good litter should be uniform and show no great variations. As hitherto practised, the system of recording the lightest and heaviest pigs is not altogether the best method of indication and may suggest a misleading average. A more efficient means will be adopted in future; for to be quite correct each pig should be noted.

Recording is carried out through the local milk recording society, and the work of the recorder includes marking and weighing the pigs at three weeks old, and in keeping the books according to special forms. Generally, each milk recording day recurs every three weeks and it is the duty of the recorder to note each sow that has farrowed since his last visit, so that he may return to weigh the young pigs at the right time. When pigs cannot be weighed at exactly three weeks, exceptions are allowed only when there is extreme difficulty in arranging for the weighing on that day. In these cases an addition or deduction of 2 kgs. (44 lbs.) per pig per day is made before or after the optimum of three weeks. No allowance can, however, be made of more than two days, *i.e.*, weighing must take place at 19 to 23 days old. Weighing is sometimes done on the milk scale by placing the pig in a suitable receptacle, but more simply by the use of an ordinary steelyard on which the pig is hung by string attached to a hind leg.



[Photo by W. E. Cole.]

Method of Weighing at Slättåkra.

Numbering takes place in succession, for example, the litter of the sow farrowing first may be numbered say 1 to 10, that of the next to farrow say 10 to 21, then 21 to 31 and so on. Marking is done either with ear clippers as for calves; or by tattooing, if equipment is available.

Some of the figures of the last recording year for the southern division of Sweden known as Skane are interesting:—

	No. of Pigs.		Average weight in lbs. at 3 weeks.		Mortality.
	At Birth.	At 3 weeks.	Per Litter.	Per Pig.	Per cent.
Large White ...	10-30	8-12	88-7	11-0	21-2
Swedish Lantras ...	10-01	8-17	95-3	11-7	18-3

The record of Svalof Jeralda also indicates the value of information collected :—

Litter No.	No. of Pigs.		Weight of Pigs in lbs. at 3 weeks.			Date of Farrowing.
	At Birth.	At 3 weeks.	Total.	Average.	Variations.	
IV	13	11	151.4	13.9	11.4—16.9	18/12/25
V	13	11	163.0	14.7	8.6—18.7	1/6/26
VI	12	9	134.6	15.0	9.9—17.2	9/11/26

Testing.—The first type-testing station, founded in 1923 on Danish lines at Astorp, in Skane, has as its main object the study of pigs from the point of view of the bacon curer. A station of this kind alone can add further information on quality and economy of food consumption. Two male and two female pigs are selected from a litter and are sent to the station where they are fed, together with other similar groups. Environments are uniform and it is therefore supposed that the results obtained should give information as to the influence of heredity upon the suitability for bacon production. Scientifically, this selection is not quite correct, for those acquainted with recent Mendelian discoveries are aware that in only a small and definite proportion does "like breed like." The whole litter should really be so tested, but in practice, quite useful results are obtained. It is suggested that the practical value would be increased if in selecting the sows whose litters were to be tested, the results of recording were considered. The aim should be to produce sows not only with good yielding capacity, but capable of *transmitting* their good qualities and breeding first-class bacon pigs. Since only a small number of pigs can be tested at the station, it is proposed that in future only those sows shall be considered that show a satisfactory yielding capacity according to this recording system.

Formerly, boars were judged on a point system for external features only, but it is now realised that this method ignores such important characters as pedigree and yielding capacity. Now that information is becoming available from the pig-recording system, the scale of points has been adjusted so that no more than 65 can be awarded for exterior, the remaining 35 being allotted for pedigree. Great importance is attached to the yielding capacity of the dam.

It is particularly interesting to note some of the details published in the three reports of this station is Skane, where Large Whites, mostly of English origin, form about 80 per cent. of the pure bred pigs :—

		Grade 1.	Grade 2.	Grade 3.
Thickness of back fat	...	1.42 in.	1.62 in.	1.80 in.
Thickness of belly	...	1.29 "	1.31 "	1.33 "

Nothing with more than 2 in. of back fat appears to be good enough for export. A comparison of hogs with gilts shows that in the latter the back fat is thinner and the streak is thicker than in the case of hogs. Of gilts 46.8 per cent. are in Grade 1, while hogs only produce 20.3 per cent. Since hogs fatten at an earlier stage it has been suggested that sometimes they might be utilised to best advantage for pork, while gilts could be kept for bacon. Thickness of belly appears to be associated with thickness of back fat, but while curers desire a thick streak, they prefer to choose the lesser of two faults and rightly place greater importance on thin back fat. Again, 59 per cent. of deep pigs are placed in Grade 1, compared with 23 per cent. of shallow ones. Deep pigs also prove to be the long ones.

Apparently there are greater variations now between the best and worst strains of one breed than between the average quality of the two breeds kept, but in course of time certain standards will emerge, with which the farmer can better compare his own figures with a view to their improvement.

The day of sentimental judging by eye alone is passing: the day of supplementary accounts and records is dawning. It has been said that a good pedigree implies an *aim* higher than the average: a good record implies an *achievement* higher than the average.

Efforts are now being made to introduce an improved system on the above lines into this country, and it is to be hoped that all interested in pig breeding will realise its ultimate value so that England may yet retain her supremacy, in pigs as well as other livestock, as the pedigree livestock farm of the world.

THE RETAIL DISTRIBUTION OF MILK IN STOCKHOLM.

BY CAPTAIN W. A. NELL, Assoc. M. Inst. Mech. Engrs.

MILK is purveyed to the population of Stockholm by a large central Milk Distributing Agency known as the Lantmannens Mjolkforsaljningsforening u.p.a. This organization was formed in 1915, when a large body of farmers took over the businesses previously conducted by five independent milk companies, so that the organization is now really under the control of the milk producers, who are the only shareholders of the company.

In May of 1927 there were 7,553 members with one share for each cow owned by them, the number of cows being approximately 90,000.

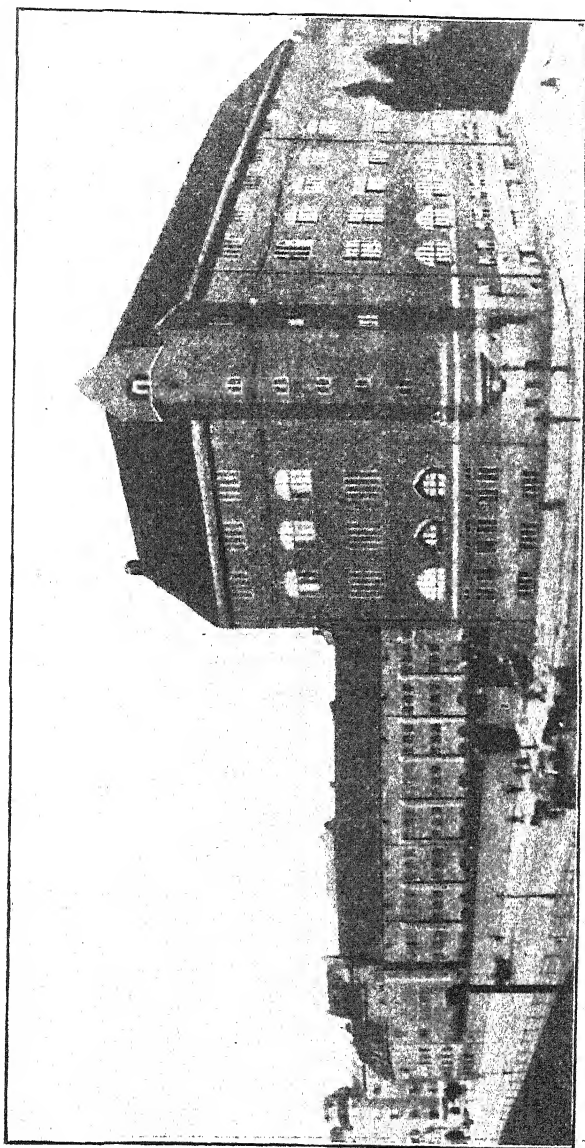
A small amount of milk is received from non-members.

Last year the average daily amount of milk received was approximately 47 million gallons; of this amount about 40 per cent. was used for liquid milk consumption in Stockholm and smaller towns in the neighbourhood, the rest being manufactured into butter and cheese, or sent back to producers in the form of skimmed milk.

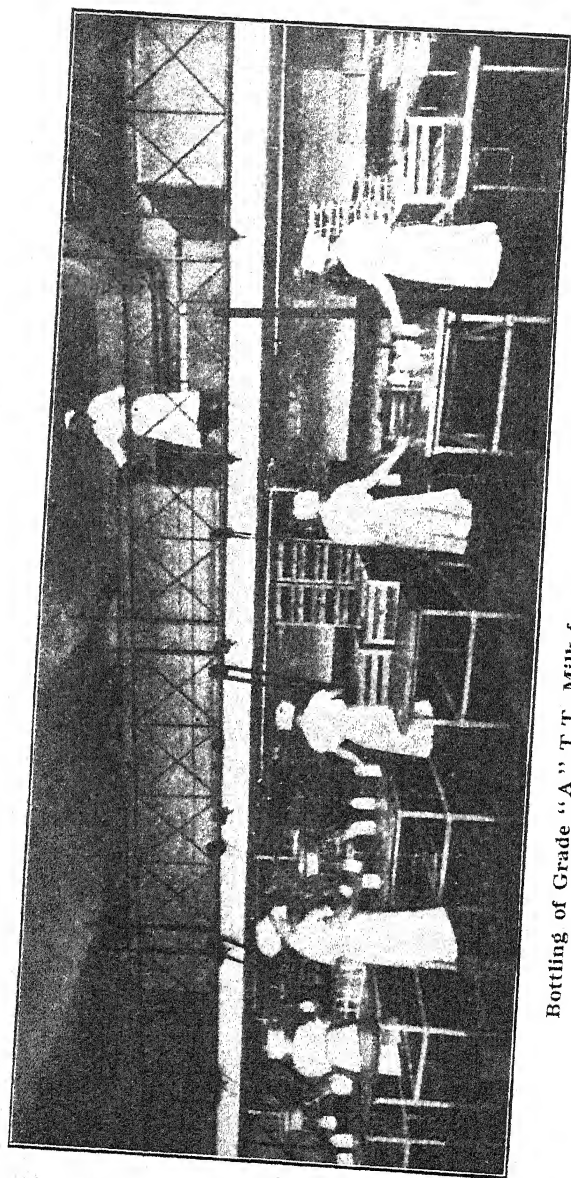
Practically the whole of the milk is distributed as loose milk, only the certified milk being bottled. This certified milk represents approximately 2 per cent. of the total milk sold for liquid consumption but it is really the equivalent of what is known in England as Grade "A" T.T. milk, as it comes in churns from farms with tuberculin tested herds, and is bottled in a specially appointed town dairy.

The actual delivery to the population is interesting seeing that no direct delivery to the consumers takes place, the milk being delivered to numerous shops, numbering in the city of Stockholm approximately 1,800. These shops are similar to what are known in the London dairy trade as sub-dairies, *i.e.*, for the sale of milk and produce over the counter.

In Stockholm, as in London and other towns, these shops are strictly inspected by the City Health Department, and all have to be licenced for the sale of milk. They are often run in conjunction with groceries, or stores, but are *always* in a separate room.



Exterior of Central Dairies, Stockholm. The five-storey building in the foreground contains the working Dairies, Laboratories, &c. The stables, farriers, harness makers, &c., are in the three-storey building on the left.



Bottling of Grade "A" T.T. Milk from storage tanks after brine cooling.

The central dairy, where the milk is handled, is a magnificent building, and compares very favourably with some of the up-to-date dairies in England. The premises consist of a large block of buildings some five storeys high, fitted with the most up-to-date plant for pasteurizing milk by the retarding process.

It will be realized that as practically all the milk is sent out in churns and cans there is no elaborate bottle washing and bottle filling apparatus such as is seen over in this country and in the United States, except for the very small amount of certified milk which, of course, is all bottled.

The milk is taken up to the third floor by elevator, where it is immediately tested as to quality and purity in a well equipped laboratory. From this floor the milk gravitates through the clarifiers, heaters and pasteurizers to the cooling floor, where there is a magnificent battery of eight capillary coolers of the Lawrence pattern, each cooler is some six feet square, and the eight are ranged in one long line on the top of a mezzanine floor, the milk flowing from the coolers into storage tanks, from whence the churns and cans are filled on the ground floor.

The plant is capable of treating milk at the rate of 3,000 gallons per hour.

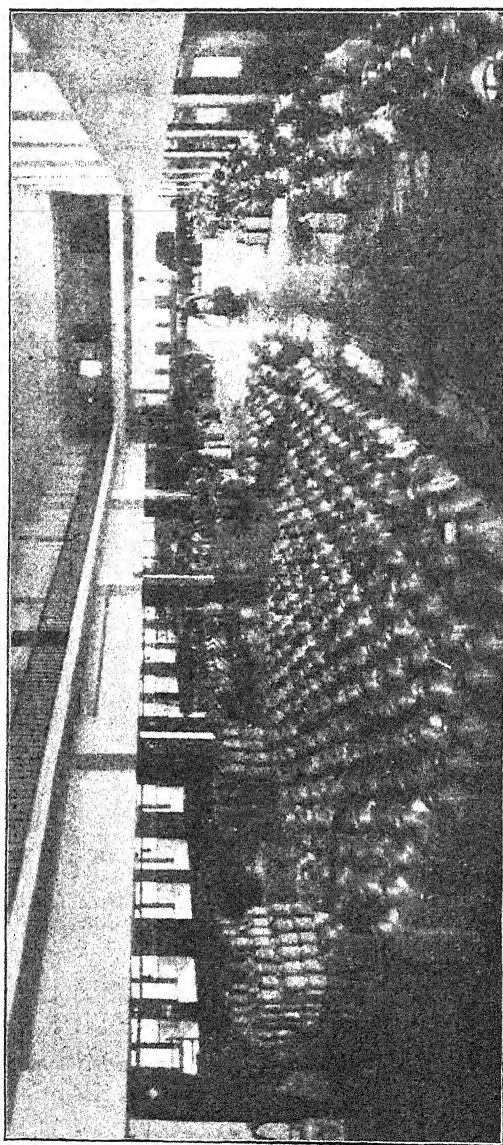
In order to regulate the supply of milk, this Milk Producers' Organization controls 110 creameries and cheese factories, and about 50 milk collection depots scattered in various parts of the country throughout the four provinces around Stockholm. From these points the railways convey the milk to the city, but during the last few years road transport has been increasingly employed, the average distance for this haulage being about 45 miles.

The refrigerating plant for cooling the milk and cold rooms at the central dairy in Stockholm is the largest in Scandinavia.

The whole of the electric power necessary to drive the plant and machinery is made on the premises by the Company's own power plant, which also furnishes the necessary supply for the lighting of the buildings.

Situated at this central depot is also a complete van building shed with painting and varnishing departments. There is also a harness-making department, and shoeing smiths' yard. The stables are in a separate building with accommodation for 200 horses on three floors.

It is interesting to note that the Government's Research Laboratories are situated in the building of this Company, who place the whole of their resources to the Government research workers.



Central Hall, ground floor. Milk despatching.

The Company's own laboratories are quite separate from the Government laboratories, and are in another part of the building.

Butter is sent to Stockholm in large quantities from the Company's creameries, out in the country.

A portion of the central depot is set aside for working and packing the butter, and the cold stores have a capacity of approximately 20,000 lbs. of butter, packed and printed for sale, and about 110,000 lbs. of bulk butter in cwt. casks.

In the erection and construction of this magnificent central dairy everything that modern science and up-to-date methods have to offer has been used. The Association carefully follows the developments of the dairy industry in every respect all over the world, in order to be able to maintain the highest standard of its products with the lowest possible cost and to the best advantage for consumers as well as the producers.

The general construction and equipment of the country creameries is very similar to those in the milk producing districts of England, but considerably more manufacturing of butter and cheese is carried on, and in this respect a very high standard of efficiency has been attained.

The working dairies are splendid examples of modern hygiene and cleanliness, and are completely equipped with the most up-to-date plant and machinery.

AGRICULTURAL EDUCATION IN SWEDEN.

By J. F. BLACKSHAW.

THE information contained in this account of agricultural education in Sweden is based largely on the address which Mr. Wackenfelt delivered before the members of the Conference in Sweden.

1.—THE HIGHER AGRICULTURAL EDUCATION.

In Sweden there are two Agricultural Colleges for providing higher agricultural education, viz., Alnarp, near the University of Lund, and Ultuna, near the University of Uppsala, where the following courses are arranged:—

(a) *Course for the degree of "Agronom"* (corresponding to B.Sc. in agriculture), lasting two years; entirely theoretical training. Each year comprises two terms which together last a little more than nine months, and the holidays nearly three months.

To gain admittance to this course it is required:—

(1) That the applicant be at least 18 years old. (The average age of the students is generally 23–24 years);

(2) That the applicant has had at least two years actual practice of farming, preferably on well-known and well-managed estates;

(3) That the applicant has a theoretical knowledge of the Swedish, English and German languages (equivalent to the requirements for passing the "realskoleexamen"), knowledge in mathematics, physics and botany equivalent to the examination standard required for Matriculation ("studentexamen"), and a good general knowledge of other subjects.

At Alnarp generally 30 students are admitted each year, and at Ultuna 22. Two students in each course at each Institute are exempted from fees and receive instruction, board and lodging free of costs. All the other students pay fees which cover about the cost of board and lodging, whereas the instruction is given practically free of cost.

In the "Agronom" course, instruction is given in all the subjects embraced by the Science of Biology on which the pure Science of Agriculture is founded. The Science of Agriculture is divided into the following subjects:—

- Pure Agriculture (Cereals and Soils),
- Animal Husbandry,
- Agricultural Economics,
- „ Book-keeping,
- „ Engineering,
- Dairying,
- Horse Breeding,
- Hygiene and Animal Diseases,
- Horticulture, and
- Forestry.

In these subjects the instruction is given by means of lectures and demonstrations. Biology—especially Chemistry and Botany—includes laboratory work.

The students have to pass private examinations one by one (tentamina) in every subject, and those who have passed all their examinations after the course of two years receive a diploma as "Agronom." In the certificate given at the final examination the student is, however, allowed to have marks below the pass standard for two preparatory subjects of smaller importance.

The "Agronom" degree entitles students to situations as Teachers at institutions of lower agricultural education, Agricultural Organisers, and some other positions in the Agricultural administration.

(b) *Special Course for agricultural experts* (Konsulent).

After having passed the "Agronom" examination it is possible for students to obtain further special instruction in any one of the following three lines:—

(a) *Course for experts in General Agriculture*, with instruction in biology and pure agriculture (cereals and soils). Agricultural economics and (eventually) other subjects in connection therewith;

(b) *Course for experts in Animal Husbandry*, with instruction regarding breeding and feeding of domestic animals and the sciences related thereto, as well as in agricultural economics.

(c) *Course for Dairy experts*, with practical and theoretical instruction in dairying, and in chemistry and bacteriology appertaining to this subject.

Each of the above-mentioned courses for experts lasts for one year. Attendance at this course is nowadays required for positions as governmental experts in cattle-breeding, dairying, seeds, &c.

In a year, on an average only about two or three persons have in each line availed themselves of these courses.

II.—THE LOWER AGRICULTURAL EDUCATION.

(a) *Agricultural Schools*.—There are now in Sweden 13 schools providing practical lower education in agriculture, at each of which there are arranged two courses, one lasting two years and the other one year.

(1) *The two year course*.—The pupils in this course pay no fees. Requirements for admission are that the pupil should have gone through a general primary school, be at least 18 years of age and have had good practice of farming.

The instruction is arranged as follows:—The course starts on the 1st of November, and during the five winter months the students have 2–3 hours' lessons a day in the Swedish language, mathematics and biology. Other hours are used for practical work, as is also the first summer when no theoretical instruction is given. During the second winter the five months are entirely devoted to the theory in various branches of farm management. The second summer is set aside for

practical work, with training in management of labourers, book-keeping, &c. The pupils pass an examination and take up practical agricultural work as bailiffs, book-keepers and so on, also as farmers.

(2) *The one year course.*—Pupils in this course pay for board and lodging. They must have had very good practice of farming and some more general knowledge than is given in primary schools. The instruction is given in common with the pupils of the second year of the two year course.

(b) *Farmers' Sons' Schools.*—At these schools, which are first intended for farmers' sons, instruction only in theory is given, completed by demonstrations. As is the case with the Agricultural Schools, this kind of school can also obtain grants from the Government, provided that—

(1) The school is connected with a farm, which farm can either be owned by the school itself or by the director of the school;

(2) That the school shall be under the direction of a Board;

(3) That the school shall have at least two permanently appointed teachers—principal and chief teacher—who must both possess the required qualifications and have passed the examination for "Agronom";

(4) That the courses of instruction must be of a certain minimum length;

(5) That there must be at least 15 and at most 60 pupils;

(6) That the local authorities must certify that the school is necessary;

(7) That the school must possess a private income equal to the amount of the State grant, over and above the so-called fixed grant (Sw. *grundanslaget*);

(8) That a certain number of pupils shall enjoy free instruction;

(9) That the minimum age of the pupils must be 18 years;

(10) That pupils applying for admission to the Farmers' Schools shall have taken part in agricultural work for at least one complete year; and, finally,

(11) That a report of the work of the school shall be sent every year to the Board of Agriculture.

The Farmers' Sons' Schools and the Schools of Rural Economy, such as the People's High Schools, have their origin in private initiative, and they are not—as is the case with the Agricultural Colleges and some few of the Agricultural Schools—the property of the State; they are generally owned by special associations formed for the purpose, which guarantee the payment of the expenses, or by the County Council or by the Agricultural Society of the province. They have, in consequence, been able to develop fairly independently, and in accordance with the greatly varying conditions existing in different parts of the country.

The permanently appointed teachers at these schools receive, however, minimum salaries established by Government regulations, and the State gives grants to provide these salaries.

There were 45 schools of this kind in Sweden in 1924. Most of them have only a winter course lasting five months, but a few of them also arrange courses lasting nine months (November-July). Some of them arrange a five months winter course and a four months "continuation course" in the summer. To these continuation courses are admitted students who have attended a five months winter course.

There are two different types of Farmers' Sons' Schools, viz. :—

(1) *Type A.*—Admission to these schools can be obtained only by students who possess education in advance of that given at primary schools, for instance by those who have passed one of the People's High Schools or four classes at a Public School.

(2) *Type B.*—Only primary school education is necessary for admission.

Instruction is given in various branches of Agriculture. At the continuation courses during the summer instruction is to a large extent given by means of demonstrations at the school farm and other well-managed farms.

(c) *Schools for Rural Economy (for women).*—There are at present 38 such schools providing courses which last three or six months. To be admitted to these schools it is necessary to have passed through only a primary school. Instruction is given in cooking, baking, washing, dairying and animal husbandry, especially regarding poultry and other smaller animals.

These schools receive grants from the Government, and so do also the girls who attend them.

(d) *Courses for training of Milk Recorders.*—These courses last six weeks. The applicant must have attended an Agricultural School or a Farmers' Sons' School. A final certificate from these courses entitles the pupil to take up a position as Milk Recorder in a Milk Testing Society. The courses are arranged at Farmers' Sons' Schools and are supported by the State.

(e) *Horticultural Schools.*—There are five schools for training gardeners (two year course) and garden workmen (one year and shorter courses). These schools are supported by the Government.

(f) *Dairy Schools.*—At present there are six Dairy Schools in Sweden. The courses last 6-12 months.

SWEDISH FRIESLAND CATTLE.

By C. W. H. GLOSSOP.

THE following are a few impressions, based upon visits to dairy farms, large and small, worked by commercial producers; also to farms of the large land owners, and lastly to the farms of the pedigree breeders, all of whom produced milk from Friesland cattle only.

Unfortunately during the visits to the larger herds time did not allow of a thorough examination of the cattle, and, in addition, the size of the party, the lack of knowledge of the Swedish language, placed one at a considerable disadvantage in gaining information upon points which one was most desirous of obtaining; therefore this short article cannot in any sense be classed as a carefully considered survey of Swedish Friesland cattle, but merely of a few lightening impressions.

In the milk producing provinces of Sweden, Friesland cattle stand absolutely alone, they are everywhere, and when it is seen that the chief product of the country is milk, and that the price obtainable at the factory for whole milk is only 6½d. to 7d. a gallon, paid for on the butter-fat content; and when it is heard what the Swedish farmer thinks of Friesland cattle, it is not to be wondered that the breed is the dairy breed of the country.

They state that the Friesland breed is the only one out of which they can make a living. The cow they work must yield a large amount of milk, and their one salvation lies in the production of quantity together with a satisfactory standard of butter-fat; and they were emphatic that no other breed could do this so well as the Friesland.

The cattle were all said to be of pure Friesland descent, not having been graded up from native cattle.

Considerable numbers of first-rate bulls continue from time to time to be imported from Friesland with remarkable success.

The cattle on the whole were typical of the Friesland breed, big roomy, deep level topped cows, full of constitution, heavy milkers with good udders, and truer in type in every respect than the Friesland cattle as seen on the North American continent and in South Africa.

By careful selection, in breeding for milk and butter-fat, a steady but sure improvement is taking place in the yield of milk and butter-fat content, without sacrificing type as has been the case in North America.

One large herd seen at Betteberga, and owned by Mr. A. Kinch, was founded in 1877; by careful selection and by line breeding, the milk yield had, during the last 25 years, been doubled, and the butter-fat content raised by decimal 46 per cent. The records of the herd for

the last 25 years which were shown to us were compiled with the greatest care and accuracy.

In this same herd were seen two consistently heavy yielding cows :—

Regula, No. 20076, who during her last seven lactations averaged 1,444 gallons milk with 3·7 per cent. fat.

Mansell, No. 25222, last four lactations averaged 1,713 gallons with 3·5 per cent. fat.

The average Friesland cow in Sweden appears to yield approximately 1,000 gallons milk per lactation.

Milk recording and testing for butter-fat is the rule in Sweden, rather than the exception as it is in the British Isles.

The greatest possible attention is given to the selection of good bulls by those who have commercial herds of milk cows, apart from the owners of pedigree herds; they have no use for a mediocre bull, the bull they use must be true to type, with milk and butter-fat ancestry.

Local Bull Societies are met with in most districts. The party were particularly interested in the local Bull Society at Simlinge; the work of this society, founded in 1902, has been thorough, and has been a source of great profit to its members, and at the same time has effected a vast improvement in the stock of the whole district. Many well known bulls have been purchased for the members of the Society. Only the best bulls are used, and are confined to those of the most noted blood lines of Friesland.

The first stock bull of the Society was Furst, he was imported from Friesland, a son of Ceres and a grandson of Albert, 1306 F.R.S.(h) the world-famous prepotent bull of Friesland, whose descendants are in such demand in the best herds of British Friesians and amongst the herds of Friesland cattle the world over.

Furst representing as he did the best strains of Friesian blood in the world had an exceptionally good influence through a large number of prominent sons.

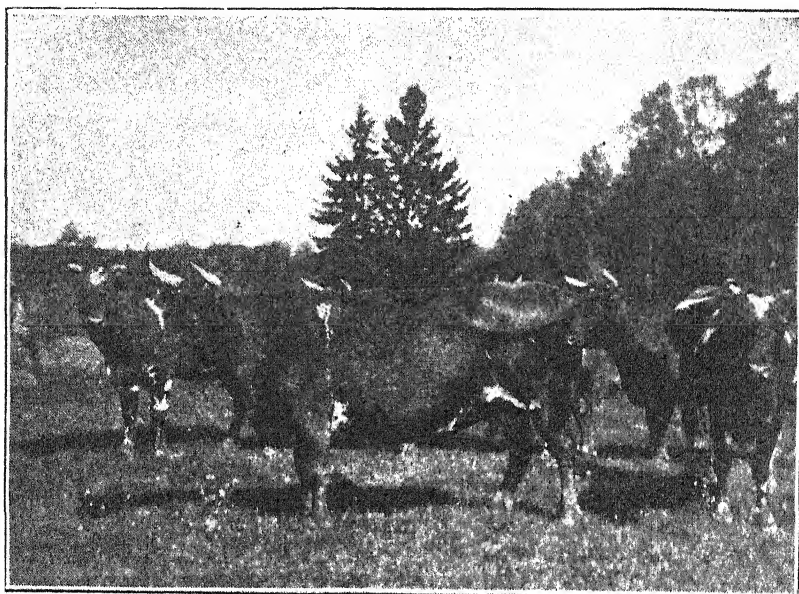
One of the present stock bulls of the Society is a grandson of Furst on both sides of his pedigree.

The thoroughness with which the Swedish commercial milk producer examines the bull problem, milk recording and butter-fat production, is the very antithesis of the haphazard methods practised by the majority of commercial milk producers in the British Isles, and British Farmers could learn a lot from a study of the methods of the Swedish milk producer. And as a result he would adopt milk recording for a certainty, and in all probability he would fill up his byres with Friesian cattle.

SWEDISH AYRSHIRES.

By FRED J. BULL.

THE first herd of Swedish Ayrshires inspected by the members of the British Dairy Farmers' Association Conference Party was at Skarhult Estate, owned by Baron Jules von Schwerin. This herd was founded in 1847, in which year three bulls and 17 young cows and heifers were imported from Scotland. The animals were bought partly from the Duke of Hamilton and partly from the Duke of Atholl.



Swedish Ayrshires.

[Photo by H. L. Gault.]

These animals thrive very well at Skarhult, and the herd increased to such an extent that by 1856 there were 60 pure-bred cows and served heifers. After this first importation only a few new strains of blood were added. Thus, inbreeding has been followed to a great extent. Among later importations the most important was the purchase in 1887 of one bull and two heifers from the late Andrew Mitchell, Munnoch, Dalry. The bull and one of the heifers did not

leave any important offspring, but the other heifer "Queen Victoria," had a great influence on the herd. By "Ayr 2nd," a bull of old Skarhult blood, she left "Prince Albert," a very well known bull in the Swedish Ayrshire breed. Her daughter, "Queen Victoria 1st," by a bull of Mr. Allan's, was also served by "Ayr 2nd," and dropped "King," a bull as well known as "Prince Albert," especially in Central Sweden. "Ayr 2nd" had a very great influence not only on the Skarhult herd, but through his sons on the whole Swedish breed. As a matter of fact, one can say that the whole modern Swedish Ayrshire breed traces back to the herd at Skarhult and the bull "Ayr 2nd." The herd was a most interesting study, and all the animals were of the early type of Ayrshire. The colour of the 100 animals in milk was of red or mired, and the bulls whole-coloured red.

Ayrshires were next in evidence at the Bjärka Säby Estate, owned by Mr. O. C. Ekman. The estate covered about 730 acres, 63 of which were used permanently for grazing. These Ayrshires are nearly all red and white in colour, some, however, are whole-coloured reds. Apart from colour the type is similar to that of the home Ayrshire, except that their vessels would not at all please our showyard judges. This herd was greatly superior to that seen at Skarhult and the animals have remarkable milk records. On the Bjärka Säby Estate they are graded according to their records. In one field there were about 60 animals whose records were 1,000 gallons with 4.2 per cent. butter fat. In another field there were a similar number of cows of the same colour and type whose records were 1,200 gallons with 4.7 per cent. butter fat. From information supplied, we learned that in 1911 the greater part of the herd consisted of pure-bred Ayrshires and the remainder were mostly of the third and fourth generations. The herd exists principally for the purpose of supplying breeding bulls, and the work is carried on under the control of the State through a Central Breeding Board. The young bulls are usually sold at the age of 18 months, and the heifers at two-and-a-half years old when in calf. We were informed that this whole territory was at one time held by the Swedish Friesian breed, but the severity of the winters led to their being supplanted by the Ayrshire.

The Swedish Ayrshire Breeders' Association has now been amalgamated with the other Swedish red and white breed, and the new Association is called the Society for Swedish Red and White Cattle.

INTER-COUNTY CLEAN MILK COMPETITION, 1926-1927.

By J. GILLARD STAPLETON.

FOLLOWING the decision of the Council of the British Dairy Farmers' Association in 1925 to encourage still further the development of the Clean Milk Movement an Inter-County Clean Milk Competition has been promoted. The first of these competitions was successfully carried out during the period June, 1925, to June, 1926, and it is pleasing to note that 18 counties entered, and that, although this number had finally to be reduced to 11, by reason of the elimination of some that could not meet the requirements of the rules of the competition, or for other reasons, the actual number of herds competing was over 400.

The competitor in the winning county showing the highest number of points is entitled to hold the Cup for one year on behalf of the county, and, in addition, he is presented with a B.D.F.A. Gold Medal, as a perpetual trophy and as evidence of the work he did in assisting to place his county in the premier position in the competition. The B.D.F.A. also decided to make money awards to the employees of the competitor with the highest points in the winning county and also to the employees of the competitors who scored the second and third highest number of points. The final awards were made as follows :—

Winning County (Cornwall) : The Stapleton Cup and B.D.F.A. Gold Medal.

Second County (Essex) : B.D.F.A. Silver Medal.

Third County (Berkshire) : B.D.F.A. Bronze Medal.

Leading Competitor in Cornwall Clean Milk Competition :
Mr. W. L. Pearce, £50.

Second Competitor in Cornwall Clean Milk Competition :
Mr. H. F. Pearce, £25.

Third Competitor in Cornwall Clean Milk Competition :
Mr. J. Downing, £10.

Head Cowmen of the above three competitors (Mr. W. A. Lee, Mr. H. M. Clayton, and Mr. E. Downing), £10, £8 and £6, respectively.

The table showing the allocation of points is given below :—

	Cornwall.	Essex.	Berkshire.
COUNTY CLEAN MILK COMPETITIONS.			
For each herd in excess of 50 ... 2 points	—	22	—
For each herd competing for first time 5 ..	55	215	35
In a competition embracing not less than 20 herds, for each 1 per cent. of herds gaining not less than 75 per cent. of possible marks for inspection 5 ..	477	270	409
Ditto for bacteriological count ... 5 ..	500	303	409
Ditto for absence of B. Coli ... 5 ..	454	295	386
Ditto for keeping quality ... 5 ..	477	352	68
Ditto for fat 1 point	100	90	95
Ditto for absence of sediment ... 1 ..	95	85	100
CLEAN MILK PRODUCTION DEMONSTRATIONS.			
On the relationship of the total number of attendances of <i>bona-fide</i> farmers on Clean Milking Demonstrations to the total number of dairy farmers in the administrative area. For each 1 per cent. ...10 points	74	473	134
MILKERS' COMPETITIONS.			
For each Competition held in accordance with the Ministry of Agriculture Scheme (Form A.241/T.D.) 20 points	240	20	80
For each Competitor gaining not less than 75 per cent. possible marks ... 5 points	1,180	45	135
LICENSED PRODUCERS.			
For each licensed certified Milk producer 5 points	5	20	30
For each Grade "A" (T.T.) Milk producer 5 ..	—	55	135
For each Grade "A" Milk producer 3 ..	45	102	—
For each producer taking out a licence for Graded Milk for the first time during the year of competition ... 5 ..	25	55	10
TOTALS	3,727	2,402	2,026

The Cup and Prizes were presented by the Rt. Hon. Walter Guinness, Minister of Agriculture and Fisheries, at the Dairy Show, and as this was the first year of the Competition it is very encouraging that a movement of such importance to the community at large should be supported in its initial stages by one holding such high office in connection with the administrative side of the industry.

Clean Milk Competitions secure a gradual improvement in the milk supplies of the country in the same way that Agricultural Shows

promote the improvement in the Breeds of Cattle, and if an increased consumption of milk per head of population is to materialise, it can only be done by giving better service, and this service must start with clean milk production at the farms.

Good service ensures public confidence and good returns, both with regard to the demand for the commodity and the price obtainable. There would not be much demand for champagne if it was put up in gingerbeer bottles, and although such a simile may appear somewhat grotesque, nevertheless it must be borne in mind that confidence and improved service will have the effect of promoting an increasing demand. Publicity without such a backing will prove to be an expensive and wasted effort.

ANNUAL REPORT OF THE CONSULTING CHEMIST.

T. J. DRAKELEY, Ph.D., M.Sc., F.I.C., F.C.S.

During the year 1927, the number of samples submitted by the members for examination showed an increase over the number for 1926, but despite this improvement, there are still considerable possibilities for development in this direction, especially considering the present membership and the additional privileges which the Council have recently granted.

It should be recalled that the Council extended the chemical privileges of membership by materially reducing all the fees for the analysis and examination of samples of dairy products, foods, soils, manures, &c.; and also granted to each member, whose subscription for the current year was paid, an additional privilege in being entitled to have one analysis of a dairy product made free of charge. These increased privileges of membership of the Association will remain in operation during the present year, and will undoubtedly be an inducement to non-members to join the Association.

The samples submitted for analysis have been very varied in character. Whilst the major portion of the work has been concerned with the routine testing of milk samples, there have been samples of water, colouring matter, feeding stuffs, poultry foods, manures and soils requiring special investigations.

It is gratifying to report that all the samples of milk received during the past year have been satisfactory in being above the Government presumptive standard in quality, whilst several have been exceptionally rich.

THE DAIRY SHOW OF 1927.

By SAMUEL R. WHITLEY, J.P.

THE Show was held on October 18th, 19th, 20th, and 21st and, in spite of the absence of competing cows, milking trials, and butter tests, was generally voted a success. Late on October 5th word came through from the Ministry of Agriculture that an outbreak of Foot and Mouth Disease had been confirmed at Edmonton, on a farm within 15 miles from the Agricultural Hall, and that no movement of cattle within the 15-mile area could be permitted until midnight on October 19th, and only then if no further outbreak occurred. The position in all its bearings was carefully explored by a small *ad hoc* Committee, and it was soon found that to hold the Milking Trials and Butter Tests at this Show was impossible, so a decision was taken to cancel all the Cattle and Goat Classes, and to carry on without cattle as best possible.

In the history of the Show such a position had occurred twice before, once over 50 years ago at the second Dairy Show, and once, 35 years ago, *i.e.*, just within the memory of one or two active members of the Council. Several new problems faced the Committee, but the greatest of all was how to fill the large space left vacant by the cattle in such a manner as would be interesting to the public. Not a moment was lost, and it was thought just possible to erect a Modern Cowshed, complete with Dairy Buildings and Food Preparing Room. Plans were prepared and passed without delay at the first meeting of the *ad hoc* Committee and the actual work of erection began as soon as the Association got possession of the Agricultural Hall, viz., six days before the opening of the Show. Various firms making fittings suitable for the purpose volunteered their help; the Association's contractors (Messrs. Kelland & Sons) worked throughout at very high pressure, so that by day and night and Sunday work the apparently impossible was accomplished—the building was ready at the opening of the Show.

The Association was specially indebted to Messrs. Louden King & Son, of Stratford, who took up the project with enthusiasm, prepared plans, and spent very long hours in seeing to their execution, so that every detail of the buildings should be complete and fit to show to the public.

As the embargo on the movement of cattle within the 15-mile area ceased at midnight of the first day of the Show it was possible to open the Show on Wednesday (the second day) with the Modern Cowshed, complete and in working order, with a complement of 24 cows, a bull and sundry calves, thus showing to the London public

a fair representation of how their milk is produced. This exhibit proved of intense interest to the public, and was crowded throughout the Show.

The remainder of the space usually occupied by competing cows was filled by bringing up into the Main Hall the Exhibitions of Roots, Dead Poultry, and the British Dairy Institute's Stand, all of which have, of recent years, been found in the Gilbey Hall. Also a few of the 40 would-be standholders who had been unable to secure space on the original allotment, were offered stands at the top of the Hall, but most of them found it impossible to prepare and erect their stands in the short time available.

In order to add to the attractions of the Show the Band of the Royal Irish Guards was engaged to play selections of music at intervals throughout the Show, thus reverting to the custom usual in pre-war days.

While the above arrangements undoubtedly saved the Show from being a failure and were, perhaps, the best possible under the peculiar conditions, it must not be forgotten that the Milking Trials and Butter Tests are the very kernel of the Dairy Show, and to hold a Dairy Show without cows is like staging the play of "Hamlet" with the Prince of Denmark left out. The sympathy of the Council goes out in full measure to those cattle exhibitors who, having spent many months in preparation, were in the end unable to exhibit their stock. At the earliest possible Council Meeting it was decided to return the entry fees for all cattle as an act of grace, though, according to the conditions of entry, this was in no way obligatory.

Apart from the absence of cattle, the 1927 Dairy Show in the main followed the lines of its immediate predecessors, but added interest was lent to it by a large space being taken in the Gilbey Hall by the Ministry of Agriculture for its Marketing Demonstrations of Eggs, Poultry, Pigs, and Pig Products. These demonstrations were designed for the purpose of bringing improved methods of marketing to the notice of home producers and all who handle home produce. The importance of standardisation as a first principle of modern commerce was emphasised throughout the demonstrations. It was constantly pointed out that it is standardisation which is largely responsible for the commercial success of imported produce on the wholesale markets of this country.

Throughout the Show this section was crowded with interested listeners, and many of the visitors must have received striking ocular demonstration of the advantages to be gained by the wholesaler who deals in imported produce. The imperative necessity for home producers offering regular consignments of attractively-staged and well-packed goods was well brought home. Many must have realised, through the means of this exhibit, what a handicap to the sale of home products the presence of dirty eggs, eggs of uneven size, poultry of irregular quality and pigs of the wrong conformation has been in the past. The educational value of this exhibit could hardly be

exaggerated, and yet it left one asking the question: How are these things to be accomplished by home producers? Wherever goods have to be consigned in large quantities, this question of standardisation solves itself by compulsion, but it is not so with large numbers of more or less small home producers. Will the next ten years find home producers grouping their produce more and more, and if so, what kind of groups should be formed? This and many other similar questions were constantly raised by the highly instructive exhibit of the Ministry of Agriculture.

The usual commercial stands were crowded with machinery and equipment designed to produce and deliver milk of high hygienic quality, and these were, on the whole, well patronised by interested people. The amount of business transacted seemed to be irregular; some firms reported good business, while others were disappointed. One firm of cattle-cake makers exhibited their usual cattle cubes of declared ingredients along with a similar looking cube of similar chemical analysis, but which had been made from rubbish, thus emphasising the need for all buyers of cattle food knowing the exact ingredients of any food bought.

CATTLE.

Generally speaking, the entries of Dairy Cows and Heifers were highly satisfactory and gave promise of a magnificent Show and good competition in the Milking Trials and Butter Tests. Only in the classes for Kerries was there any serious diminution of numbers.

During the year the Council decided, after much discussion, to cancel the usual classes for Bulls and substitute classes for the Progeny of Bulls of each Dairy Breed and to judge these animals on the points gained in the Milking Trials. Considering the novelty of the idea at the Dairy Show the entries received, viz., 16 entries in all, must be considered satisfactory.

Until the disastrous order prohibiting the exhibition of cattle (caused by Foot and Mouth Disease within 15 miles from the Agricultural Hall) came along, there was every promise that cattle at the Dairy Show would maintain their high standard both in numbers and in quality. The disappointment was keenly felt, not only by the would-be exhibitors, but specially by those responsible for the organisation of the Show.

CHEESE.

Never before have the entries of Cheese exceeded those of 1927. Cheshire was most conspicuous for its largely increased entries. The Gilbey Hall was taxed to its utmost, and but for the removal of Roots and the British Dairy Institute Stand to the Main Hall, it would have been well nigh impossible to stage them. Two or three years ago the number of cheeses comprising each entry was curtailed in the "Heavy" classes; this was done in order to economise space, but it seems to have had the effect of increasing the entries, and so defeating its object.

Before another Show is upon us the Council will be compelled either to find more space or to restrict the entries of Cheese.

Stilton Cheeses were much as usual, with 20 entries in the Six-Cheese Class against 18 entries last year, and 14 entries in the Eighteen-Cheese Class against 15 entries last year. Quality fairly good, the prizes, as usual, tended to go to the Melton Mowbray district.

The Class for Cheddar Truckles brought 33 entries and the Judge reports a very good class containing a number of really excellent Cheeses. The flavour was uniformly good, but a few were rather open in texture. The prize-winners were all well made, good-keeping Cheese.

All the Classes for Cheddar Cheese were well filled, and the Judges report a great improvement in the quality of the exhibits from the West of England. The outstanding feature of these Classes was that Mr. S. F. White, of Lock Dennis Farm, Ilchester, Somerset, not only obtained first prize, both in the Four-Cheese and Twelve-Cheese Classes, but also gained highest award in the Long-keeping Class, so demonstrating the fact that it is possible to make an article fairly ready to cut at 6-8 weeks old and at the same time to retain its flavour for many months.

The general level of the Scottish exhibits fell very far below the standard expected and found in Cheese from Scotland.

The new class for Cheddars (Long Keeping) made on or before June 30th, 1927, brought 44 entries, highly satisfactory for a start, and it evidently met a want, but the details will require some change as the cost of inspecting and marking early in July was out of all reason. It ought to be possible to find some less costly system of working these Long-keeping Classes in the future. One Judge (Mr. Mackie) suggests that June Cheeses should be made to eat and not to keep, August and September being the months for making Long-keeping Cheese. He further suggests that this class should be for one or two cheeses only made the previous year.

A few of the entries were too large for the usual trade, although of very fine quality. The ideal average would be about 84 lbs.

The bulk of the Exhibits in the Colonial Cheddar Cheese Class had been drawn from cold store within the last day or two, and the Judge recommends that in future all exhibits should be taken out of store at least one week before being shown. The quality of the Colonial Cheddars was on a fairly high level. New Zealand carried off the First and Third Prizes, while Ontario came in second.

The Cheshire Class for 12 Cheeses brought the largest number of Cheshire Cheese ever exhibited in London (over 700 Cheeses). The quality of the prize-winners was very good and they were very difficult to separate. A great many of the remainder were lacking in the texture and flavour for which the best Cheshire Cheese is noted. No doubt the very wet season accounted for this defect.

The Cheshire Class for Four Coloured Cheeses was also a large one, with 59 entries. Here again, probably due to the very wet weather,

faults were found in flavour and texture, but the prize-winning lots showed up splendidly in respect to colour, curd, and flavour.

The same remarks applied also to the *Cheshire Class for Four Uncoloured Cheeses*, with an entry of 34.

The new *Cheshire Class for Four Coloured Cheeses*, not less than 40 lbs. each made on or before June 30th, 1927, brought 13 entries, and the Judges found it a very interesting one to judge. Some lots had not kept their flavour too well, but the first prize was outstanding, and the other prize-winners were quite good lots.

The *Cheshire Class for Novices*, open only to those who have never won a prize for Cheshire Cheese at any Show of the British Dairy Farmers' Association, brought 70 entries, and is reported on by the Judges as being very strong in quantity, but leaving much to be desired in quality, except amongst the winning lots, which were very good. Mr. H. Barnett, of Corner House, Wistaston, Crewe, was first in this class, and eventually carried off the Fullwood & Bland Cup and the Lord Mayor's Cup; a very promising start for a novice.

The *Class for Factory Cheese* (for the best Exhibit of Factory Cheese to be manufactured at and exhibited by a recognised Cheese Factory dealing with a minimum of 500 gallons of milk daily in the United Kingdom—10 Cheeses of not less than 28 lbs. each (Any Variety)) brought 12 entries, against 9 in the previous year. The first prize came from Taunton, and the second from South Wales, while the third was from Market Drayton, and fourth from Axbridge, Somerset.

The *Class for Leicester Cheese*, with 10 entries against 11 last year, was reported as disappointing and not up to standard.

The *Class for Lancashire Cheese*, with 10 entries against seven last year, shows some improvement, with the Exhibits all good and of fine flavour.

Derby Cheese brought only five entries against seven last year, but quality was fairly good.

The *Classes for Double and Single Gloucesters* showed satisfactory increases in entry compared with last year. The exhibits in the former class were excellent, as were those in the latter, with a few exceptions, which were poor.

The numbers of *Caerphillies* remain much the same from year to year, with about 15 entries, and the prizes continue to go mostly to Somersetshire.

Wensleydales (Six Cheeses—Blue-moulded) don't vary much from Show to Show—only about five entries and generally the same prize-winners. This is a good selling cheese, and one would be glad to see new competitors.

Both the *Classes for Smallholder Cheese*, Long-keeping and Quick-ripening, were satisfactorily filled, the exhibits being well turned out and of good flavour.

The *Class for Small Cheddars* (Two Cheeses made at home, from 8-10 lbs. each, open to pupils who have attended County Travelling Cheese Schools during 1926 or 1927) only brought eight entries against

10 last year, and was reported as a poor class, and the Judge with difficulty found a good sample. In most cases the flavour was not clean and the texture was open and soft.

The corresponding Class for Small Cheshires only brought six entries against 11 entries last year, and was likewise disappointing.

The Inter-County Competition (for the best collection of Small-holder Cheeses made by persons who have received instruction in Cheesemaking at a County Council Cheese School during 1924-1927) showed some improvement, with three entries, and Devonshire (Instructress Miss Bray) won first prize and the John Benson Champion Shield. Some of the exhibits were quite good, but others not well made.

The Class for Cream Cheese, made from Cream only, no milk or curd to be added, as usual brought a satisfactory number of entries, viz., 20, but was not outstanding, though all the cheese exhibited were of good marketable quality. The Judge suggests that in future these should be confined to one weight, say, 4 oz.

In the Class for Unripened Soft Cheese, other than Cream Cheese made direct from milk, the entries were satisfactory, but in one or two cases the entries were disqualified owing to being ripened. The Judge suggests a specified weight of about 8 oz. for this Class in future.

The Collections of Produce, open only to Women's Institutes, showed up well. They consisted of 2 lbs. of Fresh Butter, 1 lb. of Bacon (raw or scalded), and 2 dozen Eggs, to be packed in a box and sent to the Show by Parcel Post, packages to be taken into consideration when making awards. The Mylor Women's Institute, of Mylor, near Falmouth, won first prize, while the Shifnal Women's Institute came in second.

BACON AND HAMS.

While there were no entries in the Class for Rolled Bacon, the Classes for Sides of Bacon showed a great improvement in the general style and workmanship and competition was particularly keen.

Only small entries were received in the three classes for Bacon Pigs, and the results cannot be considered satisfactory. Many of the exhibits, while fair in quality, were not suitable for the London trade, and some revision of these classes appears to be necessary. A full report on them appears elsewhere in this Journal.

There was great improvement shown in the Class for Colonial Bacon, notably in style and workmanship and general proportions and colour. First, Second and Reserve came from South Africa.

The Classes for Hams were better filled and the Judges considered them a great exhibition of really good Hams, the best collection yet seen at the Dairy Show.

BUTTER.

Speaking generally, the entries in the 2-lb. Classes were satisfactory, and a fair increase compared with last year.

The Classes for Butter, the produce of Channel Islands Cattle and their crosses, were on the whole of very fine quality, the flavour being good throughout, but a few contained excess of moisture. The Classes for Butter, the produce of Shorthorn and other cattle (Channel Islands excepted), were hardly so uniform and the texture in many cases was too open, but the flavour was generally good the prize-winners being outstanding.

The Class for Two lbs. of Butter made from Scalded Cream only was a particularly strong one, and worthy of mention. The first prize in this class also won the Lord Mayor's Cup for the best exhibit of Butter in the 2-lb. Classes.

In the Classes for Commercial Butter the entries were about double those of last year, and with a few exceptions, which were weak in texture and solidity, all the exhibits were a credit to the Show, and the Judge felt compelled to award a specially large number of commendations beyond the usual prizes.

The Class for Fancy or Ornamental Design in Butter, with foliage or other extraneous decoration, brought three entries, but only one staged, which was very fine and well deserved the First Prize.

There were 10 entries in the Class for Two lbs. of Butter made up in the most attractive form for table use, the prize-winners were very attractively made up and of good flavour.

The number of entries in the Classes for Colonial Butter was hardly up to that of last year, but the Judges in both classes report the exhibits as being of high character and well flavoured. The first prize-winner in the Salted Class, an exhibit from Queensland, was exceptionally good and of wonderful texture, scoring 97 per cent. of full marks. The New Zealand exhibits were, however, disappointing, and considered by the Judge not to be a fair sample of the average quality of New Zealand Butter.

The Class for a Collection of Colonial Dairy Produce failed to bring any entries.

CREAM.

Both the Classes for Clotted Cream and for Cream other than Clotted were well filled, with 21 entries each of good quality.

BOTTLED FRUITS AND VEGETABLES.

It was a pleasure to see more entries in most of these classes, and the better method of staging the exhibits was greatly appreciated by the visitors. The winning exhibits left little to be desired, but many of the others lacked finish, and occasionally one of last year's bottles was put in, which detracted from the general appearance.

The Demonstrations were again popular, and brought many questioners who were willingly helped.

HONEY, &c.

Considering the very bad season, the entries, though somewhat below the usual number, must be considered satisfactory. Occasionally the prize-winning samples were excellent in all respects. Excellent samples of beeswax were shown.

The Class for Colonial Honey brought only nine entries, against 10 last year. They were very good in quality and uniform in flavour, with but slight variation in colour.

ROOTS.

The competition in nearly all the Root Classes was very keen, especially so in those for Globe Mangolds and Swedes, many of the entries being of such fine quality that they were difficult to judge.

NEW INVENTIONS, &c.

The entries in these classes were more numerous than ever. They are reported on elsewhere.

JUNKET-MAKING CONTESTS.

These classes are becoming quite a feature of the Show, and the entries in the open class were so numerous that it had to be divided into three sections. Competitors came from many different districts, and so should be helpful in popularising this excellent way of using milk.

BUTTER-MAKING CONTESTS.

The interest and keenness in these contests were well maintained. The number of entries was considerably above that of last year, and the Judges were on the whole very favourably impressed, but they call attention to a singular lack of care for detail amongst some of those who are just starting their careers. There was a marked improvement in regard to the time limit which was rarely exceeded.

MILKERS' CONTESTS.

The entries in these classes showed a considerable increase compared with last year, and there was some difficulty in carrying the contests through, owing to the restricted time and number of available cows. Some excellent work was done and there was increased evidence of greater care being taken to produce clean milk.

COW JUDGING CONTESTS.

The absence of Cattle in the competitive classes due to Foot and Mouth Disease made it impossible to carry out these contests. The entries were about the same as usual in numbers.

NEW INVENTIONS, DAIRY SHOW, 1927.

By J. GILLARD STAPLETON.

NEVER before has there been presented at the Dairy Show so large an entry of new inventions.

In a sense this is a tribute to the growth and development of the dairy industry and ideas have been put into form that will assist in the further progress of the industry.

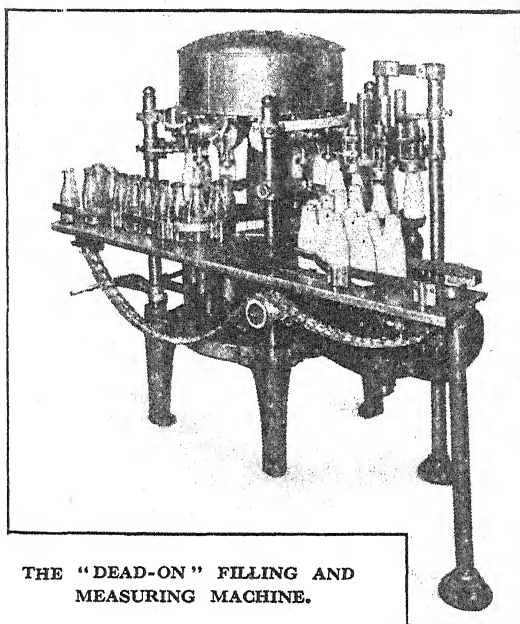
The Judges were again handicapped in making their awards by not having the opportunity of testing some of the entries under working conditions.

Comment has been made that the number of awards was distinctly small, but it must be borne in mind that free distribution of awards in such a class would obviously prejudice the value of such awards and would only tend to confuse the trade when determining the best equipment to purchase.

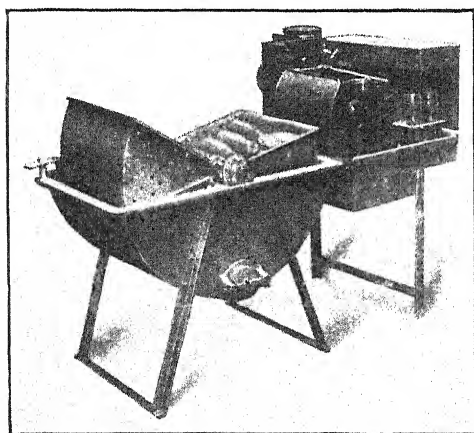
Messrs. Geo. S. Clayton, of St. Anne's Works, Limehouse, London, E. 14, were again successful exhibitors, and received the Gold Medal for their "Dead-on" Filling and Measuring Machine. The chief points of this ingenious machine, which in many respects has some entirely new features, are that it delivers dead accurate measure into each bottle and is less likely to develop the objectionable feature of some measuring machines, which after being in use for a short period will, through leakage caused by wear, deliver excess quantities. The avoidance of froth being delivered into the bottles is also a very distinct improvement, and is secured by the milk being drawn from the bottom of the feed tank instead of from the top, which is the method adopted in filling machines with measuring cups, which ride up and down inside the supply tank. By changing one small fitting, that can be done in a few seconds, different size bottles can be filled.

Another point that influenced the Judges in awarding the Gold Medal to this exhibit was the decision of the Board of Trade that they were prepared to have these machines officially stamped as passing their requirements for a correct measuring machine.

Messrs. C. D. Gabell, Ltd., were awarded a Silver Medal for their Bottle Filling and Measuring Machine, which is a very well designed machine, capable of giving accurate measure for comparatively small outputs, and meets the requirements of the Board of Trade for Measuring Machines.



THE "DEAD-ON" FILLING AND
MEASURING MACHINE.

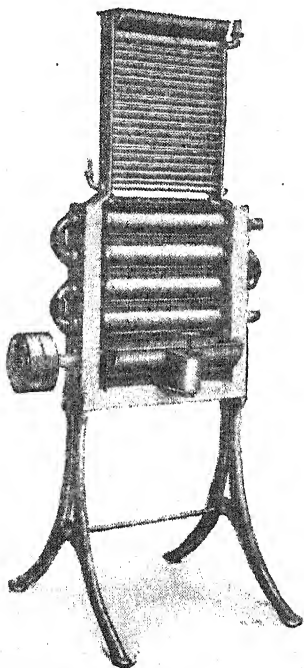


BOTTLE-SOAKING, BRUSHING, AND STERILIZING PLANT.

Messrs. George S. Clayton were awarded the First Prize for their equipment for bottle-soaking, brushing and sterilizing for small outputs. the chief points of interest in this equipment were the cleverly designed soaking arrangement, which insured a positive time interval of soaking for each bottle, and also the brushing provided for each bottle was very efficient, the bottles being thoroughly brushed inside, outside, on the ends, and, what is very important, the mouths of the bottles, including the ledge provided for the discs.

The Silver Medal awarded to the Dairy Supply Co., Ltd., for their Cream Cooler was given by the Judges because provision was made for water and brine cooling with an efficiently designed contrivance to ensure that only a thin layer of cream is presented to the cooling surface, which is obviously of the utmost importance with a product which is a very bad heat conductor and therefore difficult to cool.

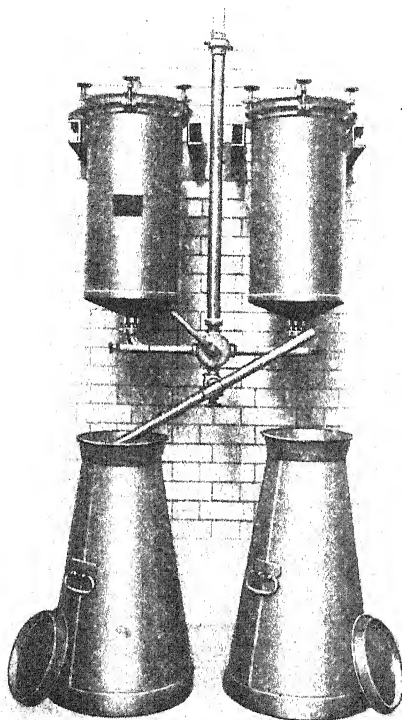
It would have been more satisfactory if the Judges could have seen this machine actually cooling cream, but as it was not in competition with any similar machine, it was not very material, as they were satisfied it would do its work efficiently.



IMPROVED CREAM COOLER.

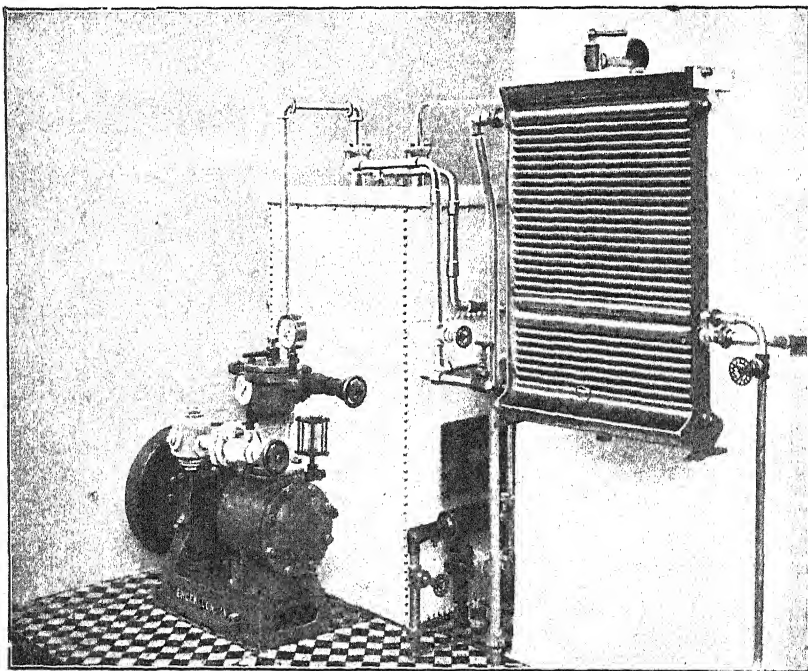
The Albro Fillers and Engineering Co. were awarded a Bronze Medal for their Pneumatic Capping Head for inserting discs in milk bottles, which eliminated the necessity of the bottles travelling round on the machine, as is usual with discing machines, this action is secured by a movable arm, which sucks the discs from a metal tube and moves over to the bottle, the bottle is automatically slowed down while passing the arm and the disc is placed firmly in position.

The Bronze Medal awarded to The Perfect Dairy Machines (England), Ltd., for their Automatic Non-Foam Can Filling Measuring Machine for filling churns and large cans was awarded because it meets a long-felt want in the trade, and was judged to be the best of its kind exhibited, but it was not seen under working conditions, which it certainly should have been, but there was not sufficient time.



**"PERFECT" AUTOMATIC NON-FOAM CAN-FILLING AND
MEASURING MACHINE.**

The Judges awarded the First Prize for Refrigerating Compressor Plants to deal with the produce from 30 to 50 cows to Messrs. Arthur G. Enock & Co., and had no difficulty in deciding as it was the only entry in this class that was capable of doing the work that the schedule provided for, and as all these plants were actually tested under working conditions, the result was the elimination of the other competitors.



REFRIGERATING COMPRESSOR PLANT.

In future, exhibitors should be required to sign a guarantee that their entries will actually do the work provided for in the schedule.

POULTRY SECTION—DAIRY SHOW, 1927.

By R. FLETCHER HEARNshaw, F.Z.S.

THE old traditions of the Show were broken this year for the first time by the enforced exclusion of the Cattle on account of an outbreak of Foot and Mouth Disease in the district. This was much to be regretted, but it certainly made the Poultry Section more attractive to those who did attend, although the combination of the two makes a better attendance because seeing the cows is a great attraction for the city visitors. The Council, in a very short time, had a model cowshed erected where the cattle used to be and this proved a very attractive exhibit.

The Poultry Section was splendid, and we saw the pick of the year's breeding and the pick of Great Britain's breeders as usual present, for there is no show that attracts so many breeders as the Dairy Show.

As an after effect of the strike and the general trade depression, combined with a very poor summer for rearing, the entry in this section showed a decrease of nearly 500 on last year, which was expected, and really made it better in penning the exhibits as it gave a little more space, which is always so limited here in our section.

Late entries are never taken at this event, and all coming after the closing date are returned, and it would be well if other societies would copy this method.

Mr. W. S. Brocklehurst is still the popular chairman of the Poultry and Pigeon Committee, and is well supported by an active lot of men whose one aim is to make the Dairy Show the best managed Show of the year. We missed our late Secretary, Mr. B. Ravenscroft, but our new Secretary rose to the occasion and carried everything through in a most creditable manner. Our President was, unfortunately, ill at the Show time and could not attend and has since died. The Association will miss him, for in Lord Kenyon we had a man who had our best interests at heart.

Mr. R. Kirk, as Chief Steward in this section, had everything in order as usual, and had a very good lot of practical stewards to help him, who did their work well.

The Judges selected to award the championship in our section were:—Messrs. R. Scott Miller, H. Abbott and G. W. Barker, and they eventually selected for the Best in the Show the very fine Aylesbury Duck shown by Messrs. James Huntley & Son, which was quite a change from the awards of former years, and it was certainly a popular victory and a good selection on the part of these three gentlemen.

Messrs. Spratt's Patent, Limited, as usual, did the penning and feeding, which is sufficient guarantee that it was done well; in fact, many birds looked better when they got home than they did when they went, which showed the little change and holiday in London did them good. Probably they appreciated having their feet dry for a week after the very wet summer, with plenty to eat and drink.

The sale of birds, as usual, took place on the second morning of the Show at eleven, in the usual spot, Mr. Walters again being the auctioneer. Bidding was brisk for many lots and many more were claimed during the Show at very satisfactory prices. The third prize Indian Game cockerel was bought by Mr. L. Ardern for £50 and he afterwards turned out to be the best bird of the season, the winning single comb Rhode Island Red cockerel, shown by Mr. W. R. Abbey, was claimed by Mr. J. H. Smith for £30. The third prize Buff Orpington cockerel, which was bred and shown by Mr. Charles Keetley, was claimed at catalogue price by Mr. G. W. Golding for £25. Mr. R. Wilkinson's medal-winning Barred Rock cockerel made £25 and Mr. W. G. Watson's medal-winning dark Dorking cockerel £12 12s. These were just a few of the principal sales, although many other birds were sold, and there was a steady demand all through the Show for anything that was good and cheap. Probably Rhode Island Reds were in the keenest demand, and many birds in this section were claimed at very satisfactory prices, the single-combed birds being in the greatest demand.

Sussex, Indian Game, White Wyandottes and Buff Rocks all sold well. In fact, the popular varieties at the moment always sell well here. Barnevelders and Bantams were both in good demand at satisfactory prices. It takes a good bird to win a Selling Class at this Show, so knowing this there is always a good demand for birds in the Selling Classes at this event. Many farmers now, as well as breeders, make a point of attending this Show to buy the stock birds they require for new blood, for here they can find a good selection of the best birds of the year.

The *Table Poultry* made a grand display, all the classes being well filled; in fact, it must rank as one of the best collections of dead poultry ever seen at this event. The Aylesbury Ducklings, which secured the Gold Medal, were a splendid pair, weighing about 26 pounds.

Eggs, as usual, made a good show. The class for Brown, with 17 entries, was a very strong class; Whites had 16 and Tinted 13 entries, and the class provided for Colonial Eggs had 12 entries.

Dorkings, as usual, were the first classes in the section for live Poultry. Entries were down on last year, and this good old breed looks like being pushed out by the newer and more popular breeds. The quality on the whole was scarcely up to the average, and we have seen much better birds shown at the Dairy Show. Several otherwise

good birds had crooked breast bones, and so were left out of the prize list, this being a very bad defect in a Dorking. The first prize and medal-winning Dark cockerel was worthy of special mention, and was easily the best bird in this section.

In the Any Other Colour Class Mr. Harold Corrie took both the first prizes with two very attractive Whites, which have much improved of late years.

Brahmas had two judges to judge 19 birds in four classes—a very poor entry for a classical Show. The Dark cockerels were a very poor lot, being mostly immature, long on leg, and short of feather under hock. The winner, although hardly out of his chicken feather, shows promise. The first and second pullets both had lovely body pencilling, but were rather weak in hock feather. The third was the best type in the class, but was smaller than the winner and much coarser in pencilling. The Light Brahmas only mustered eight in two classes; all the exhibits were good and forward for the time of the year. The winning cockerel took the medal and excelled in quality all round.

Cochins had only ten entries in two classes; a nice Buff won in cockerels and a good Black in the pullets; but like other feather-legged breeds they seem to be making room for the more popular clean-legged varieties.

Sussex are still popular, but they had the biggest drop of any section in entries this year, being 60 down on last year. In Lights we thought the quality was much below what we have seen here in past years. A lot of the cockerels were poor as regards colour owing, no doubt, to the bad summer experienced, though the winner was very nice and in wonderful feather and won the silver medal for the best Sussex. The Light pullets were uneven, those that were big and forward being out of condition and not a good colour. The Selling Classes contained a few bargains. Red Sussex made two nice classes, the winning pullet taking the special. Speckled are always attractive, and here again the winning pullet took the special, and we thought she was a very nice promising bird. The Brown Sussex seem to be getting into more hands, and they had a nice entry, the winning cockerel taking the special. The Buff Sussex have certainly made headway and they had two separate classes this time, the pullets being especially good, the winner taking the special for the best Buff. She was a very attractive exhibit.

Wyandottes make a great show here every year, and in spite of the newer breeds they still maintain their popularity for they are a good all-round breed. Four classes were provided for the Laced ones and the revival in these seems to be well maintained. The Gold pullets are making the most headway, 23 of them being present, the competition was very keen with the result that many good birds were out of the money. The same may be said of the Gold

cockerels, which as a whole were mostly too dark in colour and not quite so good as they were a few years ago. The Silvers were rather disappointing, both as regards quality and numbers. The cockerels were mostly weak in striping, with ticked and cloudy neck hackles, rather coarse lacing with poor bars and flights. The winning Silver pullet was a beauty and stood right away. The Whites, as usual, were the largest entries in this section, although we have seen better quality in this colour here in past years. Blacks probably showed the greatest improvement, for taken as a whole they were a grand lot and well judged. There are still too many pullets shown with dark legs. Columbian still maintain their popularity, and the winning cockerel and the winning pullet were two of the best chickens seen here for some years. They both combined exhibition and utility points which must go together if any breed is to maintain its popularity, for extremes are bad in any breed. Partridge had two separate classes, which were well supported. As usual, many Wyandottes were sold in the Selling Classes, and many really cheap birds were to be found there.

Orpingtons had a good classification as usual, but entries were not numerous, for this good old breed has had to give way to many of the newer varieties that are now so popular. Blacks, with 20 in two classes, were a nice lot, especially the pullets, the winning pullet taking the Cup and Medal. Whites had 15 entries in two classes and there were some nice birds amongst them. Buffs had less entries than last year in both cockerels and pullets, but we thought the quality in this colour was better. Several birds in these classes, both at the Show and afterwards, exchanged hands at big prices. Blues were less in numbers than last year, but the quality was good.

Rhode Island Reds still maintain their popularity, their fascinating colour and their good egg production always keeping them well to the front. The Single combs had the largest entry with 67 cockerels and 91 pullets. There was certainly an advance in the cockerels, for the long-legged were fewer, whilst the colour was much more uniform in quality than in former years. The main faults noticeable were light breasts, ginger hackles, and badly serrated combs. Now that shape and colour have so much improved breeders could now well pay more attention to getting better head points. The pullets were a wonderful class, and most of the old names being well to the front in the award list. In the Rosecombs 12 cockerels and 14 pullets were entered. In these classes the pullets were the better lot. The demand for good Rhode Island Reds seems to be as brisk as ever, and many good birds changed hands at very satisfactory prices.

Barnevelders had three well-filled classes, and their popularity still continues to grow. They are a very fascinating breed, and the wonderful brown eggs that they lay make them popular everywhere. The cockerels make very good table birds. As a breed they have made

very great strides in this country since they were imported from Holland.

Croad Langshans had a good entry, but the quality on the whole was not nearly so good as one usually finds here. There was not a really sound coloured bird in the cockerel class—purple barring being the chief fault and many failed in leg colour. The pullets as a class were worse than the cockerels, nearly all failing badly in comb.

Anconas, as usual, made two nice classes, the winning cockerel taking the medal.

Frizzles are very quaint but do not seem to make much headway, and the one class provided for them had only 10 entries. They are good layers and easily bred, so it is a wonder that more people do not keep them.

Polish had eight entries, and a nice Silver-laced good crested pullet won.

Old English Game were strong in numbers and good in quality and well judged. The four classes contained 95 entries, which was considered very good.

Minorcas are always popular, and the 17 cockerels and the 11 pullets made a nice show. They are now bred with neater heads, and more of the laying type than they used to be, which is an improvement.

Andalusians had a little increase in entries on last year and made two nice classes in which some promising chickens were to be seen, the winning pullet taking the special.

Leghorns made a good show, as usual, and on the whole the quality and general type were maintained. Exchequers are making headway both in marking and character, but Brown pullets were a little disappointing in softness of colour. Buffs were included in the Any Other Variety and seem to be losing favour, although very pretty and a useful colour. Whites and Blacks were well up to standard, the winning White cockerel being as nearly perfect as possible.

Rocks again made a strong section for numbers, although the quality was not quite so high as usual, due probably to the wet season. The Barred and the Buff both maintain their popularity and good prices are still obtainable for both. The chickens shown were in many cases backward.

Sicilian Buttercups show a diminished entry year by year. They promised at one time to become very popular, but that day seems to have gone.

*Silkie*s made a great show with 56 entries in three classes. The Scotch exhibitors again did well. A nice Black won the Any Other Colour class. This breed is most valuable for rearing chickens and pheasants.

Indian Game had 54 entries in two classes, and the cockerels were one of the best classes in the Show, being full of quality. It is wonderful what size and bone was to be seen in some of the chickens. Pullets were a good useful class, but did not approach the high standard of the cockerel class as a whole. The first and second pullets stood right away. They were penned in a good light which the Judge appreciated.

Campines made a pretty show. Silvers were the strongest entry, but some good quality was to be found in the Golds. Their good laying qualities make them still very popular as a breed.

Faverolles were not as good on the whole as last year, but they were very useful classes, one or two very good birds being penned.

Bresse had less entries than last year, only 27 Whites and 18 Blacks being entered in the four classes provided for them.

Any Other Variety classes are always full of interest at the big shows, the two classes containing 45 entries against 31 last year. In both classes Jubilee Indian Game won, which was rather a pity when so many other specimens of good breeds were present. In pullets, a Modern Langshan was second, which was quickly claimed at catalogue price, 63s., Modern Game being second in cockerels and third in pullets, a nice Buff Wyandotte being third in cockerels.

Breeding Pens are always one of the most attractive sections of the Show as the trios, as shown, are very instructive to the general public. The class for Rocks, Wyandottes, Sussex and Orpingtons was won by a very beautiful trio of White Wyandottes, the second being Buff Orpingtons, and the third a good trio of Light Sussex. The Any Other Variety was won by a very good trio of Indian Game, the second being a smart trio of Black Hamburgs, and the third going to a nice trio of Dark Dorkings.

Waterfowl made a strong section, as usual, and some very good birds were to be seen. Indian Runners, with an extended classification, made a good show on the whole, but some classes were badly filled. Fawns were rather disappointing, and there was a distinct falling off in numbers, the ducks were a good lot with very little to choose between them, but the drakes were a poor lot. There were large entries in the two classes for Whites, and in ducks, especially, the quality was very high, showing a distinct advance on former years. The tendency to coarse heads and shoulders and long sterns is becoming less marked, and the best birds in the colour were very little behind the Fawns in type. Any Other Colour classes had a poor entry, but there were some fine Fawn and Whites shown; markings and type were much nearer the standard and much more uniform. Blacks and Chocolates were very thinly represented, and those shown hardly reached the standard of former years. Rouens made two nice classes—not a bad bird to be found amongst them. Aylesburys made two good classes, the winning duck here afterwards being awarded the

Championship of the Show. She was, indeed, a wonderful duck and well merited her position. Buff Orpington ducks made two good classes, the quality here was good and the colour more uniform than for many years past. Magpies had one class with 12 entries, the winner standing right away. Black East Indian or Any Other Variety Ornamental had only five entries. Khaki Campbell had better entries, and made two good classes. Any Other Variety had 19 entries, the winner being a Blue Orpington duck, second a Muscovy drake, and third a Pekin drake. Toulouse Geese, bred 1927, made a good class of 14 entries, and not a bad bird amongst the lot. The winners were hard to separate and were of outstanding merit. Embden Geese were a small class of nine entries, the three winners were fine well-grown birds, the special for the best going to the winner.

Turkeys were a grand lot for quality, in fact the best lot seen at this Show for some years; the winning Bronze cockerel taking the cup and medal for the best Turkey. He was said to weigh 33 pounds, an abnormal weight for a bird of the current year.

Utility entries came up well, but were over 59 down on last year's total. The White Wyandotte pullets were the strongest class with 83 entries. Rhode Island Red pullets came next with 60 entries, and Light Sussex next with 58 entries, White Leghorn pullets having 52 entries.

Bantams are always a strong section, the Modern Game being a most representative collection, and the entries in the Old English Game Bantams were very good. Variety Bantams were a very interesting collection, the strongest classes being Black Rosecombs, Silver Sebrights, Wyandottes, Indian Game and the Any Other Variety classes. The Bantam Selling classes were well-filled this year, and many of the birds in these classes were sold.

The Judges in this section seemed to give general satisfaction, and we are indebted to them for coming so far—in many cases—to fill their engagements to judge.

PIGEON SECTION—DAIRY SHOW, 1927.

By W. S. BROCKLEHURST, J.P.

THE Forty-ninth Annual Show was held on October 18th, 19th, 20th, and 21st, 1927, at the Royal Agricultural Hall, London, and we are very pleased to be able to say that in spite of the fact that Foot and Mouth Disease prevented the cattle from appearing at the Hall this year, the attendance was nearly as good as in previous years and the receipts did not suffer as much as the Council expected, owing, no doubt, to the fact that the Poultry and Pigeon Sections were held as usual, showing that they are still a great attraction to the general public, and saved the situation, without doubt. It is only to be regretted that more space cannot be found for the staging of the Pigeons better, after it is shown that they play no small part with the Poultry in the great success of the Dairy Show, and may I venture to hope that the Council will see if it is not possible to give this section more floor space next Show. The entries in the Pigeon Section were 82 down on last year's Show, though a few over the previous year. The figures for the last four years are as follows :—In 1924, 3,028 ; in 1925, 3,094 ; in 1926, 3,180 ; and in 1927, 3,098, which number is about as many birds as can be staged in the very limited space available for the Pigeon Section at the Dairy Show, and that not without causing a certain amount of discomfort to both judges when doing their hard morning's work placing the prize cards, and to the exhibitors afterwards in looking through the birds and criticizing the judges' awards.

That the Pigeon Section is interesting to the public was again shown by the number of people who passed through the aisles each day of the Show who were not fanciers, but wanted to see the winners of the Medals and different Cups offered by the British Dairy Farmers' Association and other Specialist Clubs for competition each year. I am pleased to be able to state that no exhibitor had to forfeit his prize money this year, owing to have omitted to transfer his birds before showing them, and only one or two pens had to be marked up as ineligible to compete on account of the birds not being rung with the proper N.P.A. ring, except in the Variety Pigeon Club Classes again this year. Next year, all Pigeons, including the Toy Classes, must wear their proper ring. No unringed birds will be eligible to compete at Shows held under the National Pigeon Association Rules.

The winners of the principal trophies offered by the Association for competition this year are as follows :—

The Association's Gold Medal for the Best Pigeon in the Show bred in 1927 was awarded to Class 34, Pen 395, Mr. J. C. Hall's Norwich Cropper cock, the Reserve being Class 149, Pen 1698, Major Godfrey Heseltine's Black Modena cock.

The Jones' Memorial Trophy for the Best Adult Pigeon in the Show was awarded to Class 39, Pen 437, Mr. F. Meyer's yearling Black Carrier cock, the Reserve being Class 2, Pen 19, Mr. William Stevenson's White Fantail hen.

The Esquilant Challenge Trophy for the Best Young bird in Section 5, Archangels, Magpies, Nuns, and Long-faced Tumblers, was awarded to Class 186, Pen 2131, Mr. J. W. Neal's Dun Nun hen. Reserve being Class 114, Pen 1352, Mr. F. H. McCardie's Rosewing Long-faced Tumbler.

The Fulton Challenge Trophy for the Best Young bird bred in Section 2, Short-faced Tumblers, Barbs, English Owls, African Owls, and Turbits, was awarded to Class 86, Pen 952, Mr. J. W. Clelland's Almond Short-faced Tumbler cock, and the Reserve going to Class 52, Pen 556, Mr. George Sugden's Barb cock. The competition amongst the different birds put up for the final honours of winning these much sought after trophies was very keen, and gave the judge, Mr. F. Machin, much work and thought to settle which the winning birds should be. It is no easy matter and there are few judges with Mr. Machin's all-round knowledge of the different varieties to-day, owing to the number of just Specialist judges of certain breeds only. The owners are to be congratulated on having successfully bred and shown a bird of such merit, good enough to be able to win one of the above trophies. The details of the various varieties are as follows :—

Fantails numbered 154 entries in 12 classes, an increase of 12 on last year's entry in the same number of classes. The quantity in numbers exceeded those of 1926, and in quality the average was about on a par with recent years, but the condition of the birds generally was not of the best, being accounted for by the long spell of wet and sunless weather which greatly interfered with the growth of feathers. Several really good birds had for that reason to occupy inferior positions. Taking the classes as a whole there was least improvement in the Red, Yellow, and Silver Classes; also to a lesser extent in the Blacks, but under more favourable circumstances many of the birds would have been much nearer the ideal. The Alfred Bates' Challenge Cup was awarded to Mr. William Stevenson's White hen, Pen 19, Class 2, and the same bird was also Reserve for the Jones' Memorial Trophy. The White and Saddle Classes should have been judged by Mr. F. H. Jarvis, but owing to his being unable to act Mr. C. A. House very kindly acted in his stead. The other classes were judged by Mr. Satterthwaite.

Pouters numbered 33 in the four classes, as compared with 36 in the same number of classes at last year's Show, showing only a decrease of three, which was not to be wondered at owing to the very bad moulting season, and, taken as a whole, many of the birds showed high excellence, especially in the Old and Young Cocks' Classes. Those classes were judged by Mr. E. E. Hunt.

Pigmy Pouters.—This variety totalled the same as last year, there being 141 in the 13 classes, and they made a very good show. The quality was good and the great improvement in type is well maintained in most colours. The Pigmy Pouter Club's Challenge Cup, offered for the Best cock other than Blue, Silver or Cream, Young bird, was awarded to Class 25, Pen 273, Mr. R. Foster's Young cock, the same bird also winning the "Richard Foster Challenge Cup" for Best Red or Yellow Pied. The Pigmy Pouter Club Challenge Cup for the Best Young hen bred in the current year was awarded to Class 29, Pen 320, Mr. H. N. Leighton's Young hen. The Association's Silver Medal going to Class 21, Pen 233, Mr. R. Riddell's, Junr., Young Blue cock. These classes were judged by Mr. W. C. Watson and J. H. Watson.

Norwich Croppers had an entry of 84 in six classes, as compared with 87 in six classes last Show. Though showing a slight decrease in numbers they were a very level lot, and showed a decided improvement in type, especially the Reds, which have improved very much in colour as well as type. Several good birds were not through the moult. It was in this section that the Association's Gold Medal for the Best Young Pigeon bred in the current year was found in Class 34, Pen 395, Mr. J. C. Hall's Young Red hen—a grand pigeon and shown in splendid form. Dr. T. W. E. Royden spent a hard morning in judging this class.

Carriers only numbered 62 entries in eight classes, as compared with 80 entries in seven classes the year before, a decrease of 18, with an extra class—a very poor entry, and we venture to think that the Club would do well to reduce the number of classes and make a better average. Although the numbers were not great, the quality was good, especially in the Yearling classes. The winning yearling cock being a wonderful pigeon and shown in faultless condition. This grand pigeon was awarded the Jones' Trophy for Best Adult Pigeon in the Show, as well as the Carrier Club's Challenge Cup for Best Adult and the Association's Bronze Medal for Best Carrier in Show. Class 39, Pen 437, owner, Mr. F. Meyer, of Northampton. Mr. S. Holmbury should have judged these classes, but as he was unable to do so, Mr. C. H. House undertook his task.

Holle Croppers.—Since these classes were first put in at the Dairy Show in 1925, the entries have increased each year as follows :—In 1925, in three classes there were 45 entries ; 1926, in four classes 55 entries ; and this year in six classes there were 61, an increase of

six. The judge's remarks on this class are as follows:—"With 61 entries in six classes the entry was quite good, but I am somewhat doubtful whether the two extra classes were justified, as the entries and quality in the last two classes were poor. The first two classes (Self, Grizzle and Blue Barred) were, undoubtedly, the best, and the winning Young Blue was a bird hard to fault, excepting that it might have been broader in the chest. Some of the young birds were backward, and I had the greatest difficulty in getting some of the birds to 'show.' Possibly two factors accounted for this, the coldness of the Hall on Tuesday morning, and the fact that the birds had been fed; later in the day birds 'showed' which refused to show when I was judging. Taken as a whole the quality was good, but a few birds were shown in really bad condition, and I venture to suggest that some birds were inclined to be on the large side."

The Association's Bronze Medal for the Best Young Holle was awarded to Class 45, Pen 502, Mr. H. Whitley. Mr. Hubert Wright was the judge of these classes.

Barbs.—These classes were increased to three this year, which brought together 30 entries as against 26 last year. The type has improved very much and the birds shown are in better condition and getting free from what used to be so common—the heavily-fleshed, watery-eyed birds are not to be seen in the Show pens now. These classes were judged by Mr. H. R. Jewiss.

Dragoons.—This variety was not so well represented in numbers as last year, and had to give way to the Modena Section as being the largest section in this year's Show, there being only 352 entries in 30 classes, as compared with 420 entries in 32 classes last year, a decrease of 67. The bad season may have accounted for this big drop in numbers. The Young Classes were well supported, and the competition was very keen, many good birds not getting into the running. Birds were shown in good condition. In the Old and Yearling Classes the Blues, which were formerly regarded as the leaders of the Dragoon family, are now being hard pressed by the other colours and find it difficult to maintain their old-time proud position, their prevailing faults being excessive length of feather and lack of cobbiness. Dr. C. H. Tattersall's winning Adult cock was, however, a grand pigeon, and full of character and quality.

The Blue Chequer for shortness of feather, cobbiness and stance, held the field, and the Adult Cock Class was a great improvement on last year; it contained more than double the number of entries, and, with one or two exceptions, every exhibit was a high-class show bird and fit for the best competition.

Grizzles, as placed before the judge, would appear to be slipping back. Some good birds were found for the leading positions, but their numbers were limited, and not up to Shows of some previous years. Birds of a nice even shade of colour and with a hackle were

hard to find, and the total entry in Grizzles was small, considering the number of breeders of this charming colour. Silver, although few in quantity, are for type and quality combined a wonderful lot, and held their own well when competing with other colours, and in the Mixed Colour Classes Silver held the premier positions and well deserved the honours awarded.

Red and Yellows continue to advance both in numbers and type, and a little more perfection will be attained when the cells are lined down and complete with a little more shoulder power.

White appear to have taken a turn for the better, several good skulled birds were to be seen at this year's Show. The Dragoon Club's Cups were awarded as follows :—

The George Cotton Challenge Cup for the Best Young cock bred in the current year was awarded to Class 72, Pen 747, Mr. T. Wilkinson's Young cock, the same bird taking the Association's Silver Medal for Best Young cock.

The George Cotton Challenge Cup for the Best Young hen bred in the current year was awarded to Class 79, Pen 877, Messrs. Paterson Bros., Young Grizzle hen, and also the Association's Silver Medal for Best Young hen.

The Hewitt Challenge Cup for the Best White Dragoon bred in the current year was awarded to Class 76, Pen 820, Mr. E. C. Hollebhone's Young White cock, and also the Bronze Medal given by the Association. The Adults and Yearling Classes were judged by Mr. M. C. Marshall and the Young birds by Mr. T. J. Ambrose.

Short-faced Tumblers.—In this section 57 entries in five classes made a slight decrease on last year's entry of 64 in the same number of classes, but the quality was much better, and some very fine birds of this interesting little pigeon were to be seen, and it was in this variety that the Fulton Trophy winner was found in Class 86, Pen 952, Mr. J. W. Clelland's grand little Almond cock. These classes were judged by Mr. W. Webb.

Long-faced Tumblers.—In the Self section there was even a better entry in the 16 classes than last year, there being 257 entries as compared with 229 in the same number of classes last year, an increase of 28, the two Young Black Self Classes having no fewer than 67 entries, 32 cocks and 35 hens. The quality all through this section was good, and the competition very keen. The Blacks were all a splendid lot and gave the judge a good morning's work sorting them out. The Reds were well up to the modern requirements and the winning birds excelled in beak setting and general skull properties. The Adults come better than the Young birds. It was in the 1927 Red cocks that the least improvement was to be seen, though they may develop another year. The Red hens were exceedingly good in general Tumbler characteristics and were the great feature of the

Self section this year. The Blue Bars appear to be making great progress in the natural beak setting and are getting more of the correct formation of skull. In the Chequers and Any Other Variety Classes a variety of types were produced, no doubt due to the cross breeding which has taken place during the last few years. One or two were good, but the majority were disappointing. The Silver Medal of the Association for the Best Self Young Tumbler went to Class 89, Pen 996, Mr. J. E. Tay's grand Young Black cock. The judges in this section were Mr. J. T. Greenwood and Mr. E. O. Jeffries.

In the *Long-faced Tumbler Other Varieties* the entries numbered 186 in 16 classes, as compared with 167 entries in 15 classes the year before, an increase of 19, and as compared with 151 entries in 21 classes in 1925, which, I think, shows that the working of the different classes in this section and the number of classes offered, is about what is wanted to give good competition, this year being the largest entry of Marked Tumblers ever seen at the Dairy Show, and the quality, as well as quantity, was very good. In the Baldheads the Old birds were well up to the average, but in the Young classes, as a whole, showed much improvement. In the Beards Classes the quality was good, a good even lot. Mottles and Rosewing.—The competition in these classes was very keen, the Black Class containing some wonderful birds and the quality was of the highest. The Reds were a good lot and the Reserve for the Esquilant Trophy was found in Class 114, Pen 1352, Mr. F. H. McCardie's Red, the same bird taking the Association's Silver Medal for the Best Young Long-faced Tumbler other than Self. Mr. A. Lawton was the judge in this section.

English Owls.—The entries this year were again down and as compared with last year, showed a decrease of 25 in nine classes, there being 85 entries in the nine classes; last year, 110 in the same number. Some of the older classes being very poorly represented. The Old Hens and Yearling Classes—the quality was good and birds shown in good condition.

The Gatty Challenge Cup for Best Young Bird bred in the current year was awarded to Mr. W. Prince Smith's Blue cock, Class 126, Pen 1475—a wonderful headed pigeon.

African Owls.—These classes at the Dairy Show have gone from bad to worse, and what I said last year cannot be far wrong. As no support was forthcoming from the African Owl Club this year, the Association put two Young classes on with the result that only five or six entries were forthcoming in the two classes, so they were cancelled and the room given to other varieties who supported the Association.

Turbits showed an increase of 11 entries this year on last with 77 entries in eight classes, as compared with 55 in the same number last year. This is not up to what has been seen at the Dairy Show in other years. One or two birds were not shown in the best condition,

but take them on the whole they were a very good lot. The Association's Bronze Medal going to Mr. M. C. J. Sparrow's grand Young cock in Class 132, Pen 1577. Mr. R. Arkwright took this class.

Archangels numbered 48 entries in four classes, as compared with 55 entries in the same number of classes last year, a decrease of seven. Again the Young classes were the biggest, the Old classes being rather poor, many of the birds were moulting and lacked finish, and the quality was hardly up to the usual standard of excellence seen at the Dairy Show, several specimens showing brown both on wings and back and a tendency to green in the neck. On the other hand, the class for Young cocks was particularly strong and competition was keen. The winning Young cock, which carried off the Association's Bronze Medal for Best Young Birds, was full of quality and wonderful sheen and well shown by Mr. H. Leigh-Lye, Class 141, Pen 1603.

The blue tail, which was so often seen, seems to a large extent to be eradicated, and could not breeders endeavour to eliminate the tendency to rustiness of feathers, both in wings and back, which appears at present to be too prevalent in many birds seen in the Show pens. They were a good lot, and Mr. A. A. Goodall was the judge of this section.

Modenas came up well and headed the Show this year with 402 entries in 34 classes, as compared with 354 in 34 classes last year, and as compared with 329 entries in 34 classes in 1925, and an increase of 48 as compared with last year's total. They were a grand lot, the Gazzis numbering 232 entries in 18 classes, and the Schiettis 179 entries in 16 classes, as compared with 207 Gazzis in 18 classes in 1926 and 147 Schiettis in 16 classes in 1926, this being an increase in both sections of this breed. The Gazzis were a good lot and competition in the Modena Fancy is very keen to-day. The Blues have much improved and better bars are to be seen in most of the Blues in the Show pen. Blacks were a good lot and much improved, and some grand-headed birds were to be seen, and also good necks. Bronze classes were well filled, but as the Tri Bronzes were shown with the Plain Bronzes in the old class, the Plain Bronzes did not get their share of the awards due to them, as there were some very typical birds to be seen and far ahead of the winning Tris in these classes. The Reds have greatly improved in type and head properties, and some really good Reds were on view, but here again, as they were shown up against Silvers and other colours, they did not get their just rewards, all the chief honours being given to the Silvers, which were only a medium lot. In fact, I am afraid many fanciers found it hard to follow the judges' awards in the Gazzi Classes. Some of the Blacks, Tris, and Silvers that were winning, were lucky to have got in the award list at all. The Schietti Classes were a great improvement as regards quantity and quality this year. Type was well maintained all through the various classes, and the markings were far superior, especially in the Argents, than in former years, and the Bars, in the Blues, has greatly

improved in colour, and the Black was showing a better Modena type and richness of colour. Take this section as a whole they made a wonderful show of variety of colours and markings, and the public are greatly interested in these grand little pigeons of pose.

The winners of the Modena Club Challenge Cups and the Association's Silver Medals are as follows :—

The Cup for the Best Gazzi Cock bred in the current year was awarded to Major G. Heseltine's Black cock, Class 149, Pen 1698, this same bird taking the Association's Silver Medal for the Best Young Gazzi Modena.

The Cup for the Best Schietti Cock bred in the current year was awarded to Dr. W. H. Tattersall's Argent cock, Class 169, Pen 1946.

The Cup for the Best Schietti Hen bred in the current year was awarded to Mr. W. S. Brocklehurst's Blue Barred hen, Class 166, Pen 1922, this same bird was also awarded the Association's Silver Medal for the Best Schietti bred in the current year.

The Cup for the Best Adult Gazzi Hen was awarded to Mr. A. C. Tattersall's Black hen, Class 148, Pen 1692.

The Cup for the Best Adult Schietti hen was awarded to Col. R. Burlton's Argent hen.

The judges were : Black and Bronze Gazzi Class, Mr. W. E. Belcher ; Other Colour Gazzi Classes, Mr. H. W. Foster ; and the Schietti Classes, Mr. F. Machin.

Jacobins numbered 54 entries in six classes, nine less than last year in the same number of classes. It is a pity we do not see more of this breed shown at the Dairy Show, but it seems that this Show is too early for this variety to be ready for the Show pen, and this year's wet, cold season would handicap an essential feather breed. Those that did turn up were in good condition and shown well, and the classes were all about the same average. Mr. Harry Coalston was the winner of the Association's Bronze Medal with a grand feathered good cock, Class 178, Pen 2044, the judge being Mr. H. Wilkinson.

Nuns came up well with 77 entries in the six classes as compared with 68 in five classes last year, nine more than last year. The Young classes were by far the largest, and many good birds were penned and were well up to the average for quality though many were far from through the moult. Mr. J. W. Neal showed a grand Dun hen which carried off the Esquilant Trophy and also the Association's Bronze Medal, and was a wonderfully balanced pigeon and shown in wonderful condition. Class number being 186, Pen 2131. Mr. E. W. Savery judged these classes.

Oriental Frills.—There were 146 entries in 14 classes this year, the same as last year, and I am pleased to see that the increase of 34 entries on the 1925 Show was maintained. One or two classes were not well filled. The quality throughout was very good and well up to the standard and condition of the birds—surprising after the bad season—and the fine lacing and markings of these birds were much admired. The Association's Silver Medal went to Class 194, Pen 2207, Captain W. Turton's Blondinette cock, a charming pigeon. The judge being Mr. G. E. Hope.

Maggies had an increase of 11 entries, there being 74 entries in six classes, as compared with 63 in the same number of classes last year. The quality was up to the average, especially in the Yellow Hen Class, which was very marked and more of the slender stately Magpie type of past years was to be seen. The Bronze Medal of the Association was awarded to Class 206, Pen 2343, Mr. C. H. Rolstone's grand Young Yellow hen, the judge being Mr. H. Brook.

Marthams.—The one class given to this breed only brought together seven entries as compared with 11 last year. This comparatively new breed makes no progress, and has little appeal to breeders, and the birds this year looked less attractive than usual. Mr. H. Brook also judged this class.

Antwerps numbered 43 entries in six classes as compared with 53 entries in the same number of classes last year, a drop of 10. The Old classes being very poor in numbers. The judge's remarks on this section are as follows :—“The Section although reduced in numbers was very fine in quality, especially the two Young classes. The winning Young cock, and the first and second prize Young hen were birds of exceptional merit, but otherwise I was not struck with the youngsters. In the Adult Classes the winning cock and hen were true Antwerps—quality, substance, with activity. Yearlings were equally as good and the section as a whole shows progress in quality. I found no birds with wet-eye or coarseness, and, with few exceptions, the birds had well filled faces, a very great advance on a few years ago, where in every class one expected to find one or more coarse or wet-eyed bird in every class.” The Association's Bronze Medal was awarded to Class 215, Pen 2421, Mr. R. Brewis's Young hen. Mr. Hubert Wright judged these classes.

Show Homers numbered 120 entries in 12 classes, as compared with 145 entries in 12 classes last year, 25 down on last year and 32 down on 1925, a great falling-off in this section. I understand that the breeders of this variety have had a very bad breeding season. The quality of the Old birds was good throughout, but in the Young classes the entry was poor, and with the exception of one or two of the young birds the quality was not up to the average. The Challenge Trophy offered by the Show Homers Club for the Best Bird of any age was awarded to Class 217, Pen 2448, Mr. T. Adams' Blue hen. The

Association's Silver Medal for Best Young Bird went to Class 226, Pen 2543, Mr. G. R. Hartley's Young cock. Mr. H. Pilling judged these classes.

Racing Pigeons numbered 221 entries in six classes as compared with 259 in the same number of classes last year, a drop of 38 birds. They were all wonderfully filled classes, especially the Homer classes. Class for Cock Homer at least 75 entries during 1927 had no less than 57 entries, and this section gave the judge a long day's work and much thought and no light task to find the winner in such big classes of birds of the real good type of racing birds.

The winners of the three Cups again so kindly offered by Lt.-Col. A. H. Osman are as follows:—

The Victory No. 2 Challenge Cup for the Best Racing Pigeon in Show was awarded to Mr. R. J. Worton's Young hen, Class 231, Pen 2671.

The Cup for the Best Young Racing Pigeon was awarded to Mr. R. J. Worton's Young hen, Class 231, Pen 2671, the same bird also taking the Association's Silver Medal for Best Racing Pigeon.

The Cup for the Best Old Racing Pigeon was awarded to Mr. R. Thorpe, Class 229, Pen 2582. Mr. G. Oxley was the judge of these classes.

Exhibition Flying Homers.—This section showed an increase on last year's entries, there being 76 entries in six classes, as compared with 64 last year in the same number of classes, and all the classes this year were well filled and a great improvement was noticeable in type and quality in the Chequer Classes. The Bronze Medal of the Association for the Best Exhibition Flying Homer was awarded to Mr. H. F. Fox's Chequer hen, Class 237, Pen 2812, a grand typed bird and well shown. Mr. P. Taylor handled these classes.

Genuine Homers.—The four classes given this year had an entry of 46, as compared with 37 last year, an increase of 10, a great improvement is to be seen in a uniform type of birds shown, and the birds were shown in grand condition. Mr. John W. Bebb was the judge of this section.

The Variety Pigeon Classes were all judged by Mr. J. Mundell, and were a very interesting lot of birds and all shown in faultless condition, and the quality was well above the average.

Ptarmigans numbered 10 in the one class, as compared with 22 in two classes given last year. They were a beautiful lot of birds and shown in faultless condition and a more uniform type was to be seen this year.

Ice numbered 11 in the one class, the same as last year, and the correct colour for Ice pigeons is now a recognised thing, and all birds were of that same beautiful soft colour and were much admired.

Strassers numbered 12 in the one class, one more than last year, and were to be seen in Blues, Blacks, Reds, and Yellows and Blue Chequered this year, but several were very far from being the correct type and have a long way to go yet to come up to the Blues.

Swifts numbered only seven in the one class, as against 10 last year, and I regret to say that all entries but one were from the same loft. They were a grand lot and with their wonderful length of thighs and tail were seen to advantage in the special large pen provided, and their colouring was much admired by all.

Swallows numbered 12 entries, the same as last year, and were also a wonderful show, and were shown in perfect condition, and it was in this variety that the Winner of the Association's Bronze Medal for the best of these classes was found in Mr. J. MacGregor's Blue Fairy Swallow, with most wonderful foot feathers, and shown wonderfully with not a quill bent or broken and well deserved the honour, it being Pen 2938, Class 248.

The Any Other Variety Class catered for by the Variety Pigeon Club was a new class for the first time this year, and well justified being put in, there being a total of 26 entries, and they were a wonderful lot and all shown in splendid condition and were typical specimens of these different breeds. Mr. J. Mundell also judged this class.

Runts numbered 10 as compared with 14 last year; this breed seems to get less each year in numbers shown, but the quality of the birds seen is good and the condition fair, though they are still somewhat deteriorating in size for a table pigeon.

Mondains entered nine in the one class; last year they were classed with Maltese and Carneaux, when two classes were given totalling 20 entries in the two. They also are a good table pigeon if bred for such, and might be taken up more for that purpose.

Maltese.—This class was put in this year, but only four entries turned up, and all came from one loft but one; the three from Mr. F. H. Cobb's loft were of true Maltese type and shown well.

Any Other Variety Class had to be cancelled. Mr. A. Houghton, Judge, thus lost these breeds.

Selling Classes numbered six classes, two at £5, two at £3, and two at £2, and brought together 105 birds, as compared with 102 entries in the following classes last year, four at £4, four at £3. The quality of the birds in these classes was well up to the average and several good birds changed hands. It is very surprising that the public don't take more advantage of these selling classes, when the quality of the birds seen winning in them is shown.

Mr. A. Houghton also judged the four Selling Classes.

In concluding my report on the Pigeon Classes of the 1927 Dairy Show, I must again thank those who helped to get the work done in this section and making the success that the Dairy Show was again this year, and my best thanks are due to my Association Steward, Mr. H. J. Heppell, and all my other stewards for all the help and assistance so ably and willingly given by them during the Show, I sincerely trust and hope to the entire satisfaction and pleasure of all those who exhibited and whom I had the pleasure of seeing at the 1927 Dairy Show.

Our new Secretary is to be congratulated on the way he coped with the new difficulties that arose this year at the eleventh hour owing to cattle having to be absent on account of the Foot and Mouth Disease Regulations in force, and I much appreciate all the help received from him and his staff during the Show when required, which helped materially to lessen the hard work and responsibility of running the Pigeon Section at the Dairy Show. The results of this year's Show, under the circumstances, must be a source of great pleasure and congratulation to all concerned, and a proof that the Poultry and Pigeon Section is an essential to the success of the British Dairy Farmers' Association Dairy Show in future.

AWARD OF PRIZES, DAIRY SHOW, 1927.

COWS, HEIFERS AND GOATS.

Classes 1 to 54 cancelled owing to Foot and Mouth Disease.

CHEESE.

- Class 55.—STILTON (6 Cheeses).—*First Prize* (£7) to Henry Thompson & Sons, Ltd. *Second Prize* (£4) to F. Webster. *Third Prize* (£2) to J. M. Nuttall & Co., Ltd.
- Class 56.—STILTON (18 Cheeses).—*First Prize* (£10 and Silver Medal) to United Dairies (Wholesale), Ltd. *Second Prize* (£5) to J. M. Nuttall & Co., Ltd. *Third Prize* (£3) to Miss I. McNair.
- Class 57.—CHEDDAR TRUCKLES (6 Cheeses).—*First Prize* (£5) to E. G. Barnes. *Second Prize* (£3) to W. Cole. *Third Prize* (£1) to A. J. Douglas.
- Class 58.—CHEDDAR (4 Cheeses not less than 40 lbs. each).—*First Prize* (£7), the Lord Mayor's Champion Cup and the "N.K.J." Challenge Cup to S. T. White. *Second Prize* (£4) to G. R. Cole. *Third Prize* (£3) to F. Portch. *Fourth Prize* (£2) to J. P. Hunter.
- Class 59.—CHEDDAR (4 Cheeses, Long Keeping not less than 40 lbs. each, made on or before 30th June, 1927).—*First Prize* (£7) to S. T. White. *Second Prize* (£4) to F. G. Nurse & Sons. *Third Prize* (£3) to K. J. M. Henry. *Fourth Prize* (£2) to W. Goldie.
- Class 60.—CHEDDAR (12 Cheeses).—*First Prize* (£15 and Silver Medal) to S. T. White. *Second Prize* (£10) to W. Cole. *Third Prize* (£7) to F. Portch. *Fourth Prize* (£5) to W. Cochrane. *Fifth Prize* (£3) to S. McMin.
- Class 61.—COLONIAL CHEDDAR (4 Cheeses, Coloured or Uncoloured, not less than 60 lbs. each).—*First Prize* (Gold Medal) and the "Hansen" Challenge Trophy to The Edendale Dairy Co. *Second Prize* (Silver Medal) to W. C. Taylor. *Third Prize* (Bronze Medal) to The Hopelands Dairy Co.
- Class 62.—CHESHIRE (12 Cheeses).—*First Prize* (£15) and the "Robert Barbour" Prize (£5) to P. Fearnall. *Second Prize* (£10) to W. R. Lea. *Third Prize* (£7) to H. S. and W. G. Whittaker. *Fourth Prize* (£5) to W. H. Hobson. *Fifth Prize* (£3) to O. Hesketh.
- Class 63.—CHESHIRE (4 Coloured Cheeses, not less than 40 lbs. each).—*First Prize* (£7) to F. Huntbach. *Second Prize* (£4) to W. H. Hobson. *Third Prize* (£2) to W. E. Moore.
- Class 64.—CHESHIRE (4 Uncoloured Cheeses, not less than 40 lbs. each).—*First Prize* (£7) to W. H. Hobson. *Second Prize* (£4) to Mrs. Yarwood. *Third Prize* (£2) to P. Fearnall.
- Class 65.—CHESHIRE (4 Coloured Long Keeping Cheeses, not less than 40 lbs. each, made on or before 30th June, 1927). *First Prize* (£7) to W. H. Hobson. *Second Prize* (£4) to W. E. Moore. *Third Prize* (£2) to O. Hesketh.
- Class 66.—CHESHIRE (4 Cheeses, not less than 40 lbs. each).—Open only to those who have never won a Prize for Cheshire Cheese at any Show of the British Dairy Farmers' Association.—*First Prize* (£5), the Lord Mayor's Champion Cup, and the "Fullwood and Bland" Challenge Cup to H. Barnett. *Second Prize* (£3) to W. S. Wright. *Third Prize* (£2) to I. J. Brown.

- Class 67.—FACTORY.—To be manufactured at and exhibited by a recognised Cheese Factory dealing with a minimum of 500 gallons of milk daily in the United Kingdom. (10 Cheeses, of not less than 28 lbs. each, any Variety).—*First Prize* (£7) to C. M. Hallett. *Second Prize* (£4) to Ben Salmon & Co., Ltd. *Third Prize* (£2) to H. Edwards & Son, Ltd. *Fourth Prize* (£1) to Cheddar Valley Dairy Co.
- Class 68.—LEICESTER (4 Cheeses).—*First Prize* (£4) to J. O. Burchnall. *Second Prize* (£3) to J. Harrison. *Third Prize* (£2) to East Anglian Institute of Agriculture.
- Class 69.—LANCASHIRE (4 Cheeses).—*First Prize* (£4) to J. Cowpe. *Second Prize* (£3) to S. Salthouse. *Third Prize* (£2) to J. Shorrocks.
- Class 70.—DERBY (4 Uncoloured Cheeses, not less than 25 lbs. each).—*First Prize* (£4) to Cheddar Valley Dairy Co. *Second Prize* (£3) to British Dairy Institute. *Third Prize* (£2) to P. Swain.
- Class 71.—DOUBLE GLOSTER (4 Cheeses, from 26 lbs. to 30 lbs. each, total weight not to exceed 120 lbs.).—*First Prize* (£4) to Mrs. W. Haine. *Second Prize* (£3) to Mrs. E. F. Jones. *Third Prize* (£2) to G. Barnes.
- Class 72.—SINGLE GLOSTER (4 Cheeses, from 13 lbs. to 15 lbs. each, total weight not to exceed 60 lbs.).—*First Prize* (£4) to Mrs. W. Haine. *Second Prize* (£3) to Gloucester Dairy Supply, Ltd. *Third Prize* (£2) to Mrs. E. F. Jones.
- Class 73.—CAERPHILLY (4 Cheeses, not exceeding 8 lbs. each).—*First Prize* (£4) to Miss S. Hembury. *Second Prize* (£3) to Mrs. C. Woodward. *Third Prize* (£2) to T. Wilkins.
- Class 74.—WENSLEYDALE (6 Blue-moulded Cheeses).—*First Prize* (£4) to A. Rowntree & Son. *Second Prize* (£3) to British Dairy Institute.
- Class 75.—SMALLHOLDER PRESSED (2 Long Keeping Cheeses, not exceeding 8 lbs. each).—*First Prize* (£3) and the "Walker" Challenge Cup to E. Walter. *Second Prize* (£2) to Miss A. Pike. *Third Prize* (£1) to G. Barnes. *Fourth Prize* (10s.) to H. H. Pickford.
- Class 76.—SMALLHOLDER PRESSED (2 Quick Ripening Cheeses, not exceeding 8 lbs. each).—*First Prize* (£3) and the "McWilliam" Fruit Dish to Mrs. A. J. Pyne. *Second Prize* (£2) to Miss W. Fry. *Third Prize* (£1) to Miss C. Edwards. *Fourth Prize* (10s.) to Drove Farm Dairy.
- Class 77.—SMALL CHEDDAR (2 Cheeses, made at home, from 8 lbs. to 10 lbs. each). Open to Pupils who have attended County Travelling Cheese Schools during 1926 or 1927.—*First Prize* (£3) to Mrs. D. I. Bauwell. *Second Prize* (£2) to Miss E. A. M. Gurd. *Third Prize* (£1) to Miss C. Gaisford.
- Class 78.—SMALL CHESHIRE (2 Cheeses, made at home, from 8 lbs. to 10 lbs. each). Open to Pupils who have attended County Travelling Cheese Schools during 1926 or 1927.—*First Prize* (£3) to Miss E. Barratt. *Second Prize* (£2) to J. J. Furber. *Third Prize* (£1) to A. P. Sadler. *Fourth Prize* (10s.) to I. J. Brown.
- Class 79.—INTER-COUNTY COMPETITION (for the Best Collection of 8 Smallholder Cheeses made by four individual persons in their own dairies, and who have received instruction in Cheese-making at a County Council Cheese School during 1924-1927).—*First Prize* (£10 and Challenge Shield) to Devonshire. Instructress, Miss Bray. Competitors, Mrs. Blatchford, Mrs. Cogan, Mrs. Payne and Miss M. White. *Equal Second Prize* (£7 each) to Monmouthshire. Instructress, Miss M. M. Trippe. Competitors, Miss M. Cowle, Miss E. Ellaway, Miss B. Gale, and Miss E. Preece; Wiltshire. Instructress, Mrs. I. M. Bull. Competitors, Mrs. Banwell, Miss C. Gaisford, Miss Pike, and Miss Tuck.
- Class 80.—CREAM (6 Cheeses, made from pure cream only, no milk or curd to be added).—*First Prize* (£1) to Miss M. E. Gordon. *Second Prize* (10s.) to Hammett's Dairies, Ltd.
- Class 81.—UNRIPENED SOFT (4 Cheeses, other than cream cheese, made direct from milk).—*First Prize* (£1) to East Anglian Institute of Agriculture. *Second Prize* (10s.) to Mrs. Howard Palmer.

COLLECTION OF PRODUCE.

Class 82.—Open only to Women's Institutes. To consist of 2 lbs. Fresh Butter, 1 lb. of Cream (raw or scalded), and 2 dozen Eggs. The Collection to be packed in a box and sent to the Show by Parcel Post. Packages to be taken into consideration when making awards.—*First Prize* (£5) to Mylor Women's Institute. *Second Prize* (£3) to Shifnal Women's Institute. *Third Prize* (£2) to Three Hills Women's Institute.

BACON.

Class 83.—ROLLED, Pale Dried with skin on, cured on the Farm or in the Home.—No entry.

Class 84.—FOUR SMOKED SIDES, Mild Cured in Wiltshire Style, with Ham attached.—*First Prize* (Silver Medal) to West Somerset Dairy and Bacon Co., Ltd. *Second Prize* (Bronze Medal) to M. Venner & Sons, Ltd.

Class 85.—FOUR PALE DRIED SIDES, Mild Cured in Wiltshire Style, with Ham attached.—*First Prize* (Silver Medal) to M. Venner & Sons, Ltd. *Second Prize* (Bronze Medal) to West Somerset Dairy and Bacon Co., Ltd.

Class 86.—TWO SIDES OF BACON SMOKED, TWO SIDES OF BACON PALE DRIED, TWO HAMS SMOKED, AND TWO HAMS PALE DRIED (the weight of the sides not less than 56 lbs. and not more than 68 lbs. each; the Hams not less than 12 lbs. and not more than 20 lbs. each).—*First Prize* (Gold Medal) to J. R. Johnson & Son. *Second Prize* (Silver Medal) to M. Venner & Sons, Ltd. *Third Prize* (Bronze Medal) to West Somerset Dairy and Bacon Co., Ltd.

Class 87.—BACON PIGS (3 hogs and 3 gilts, farrowed on or after 1st March, 1927, by a registered sire out of a registered dam of the same breed, entered by their respective Breed Societies).—Prize (The "Whitley" Challenge Cup) to the Gloucestershire Old Spots Pig Society.

Class 88.—BACON PIGS, PEDIGREE (1 hog and 1 gilt, farrowed on or after 1st March, 1927, by a registered sire out of a registered dam of the same breed).—*First Prize* (the "Beale" Challenge Cup) and [the "Harris" Challenge Cup to F. H. Rea (Gloucestershire Old Spots). *Second Prize* (£3) to J. H. White (Gloucestershire Old Spots). *Third Prize* (£2) to G. H. Eustice (National Long White Lop-eared).

Class 89.—BACON PIGS.—FIRST CROSS (1 hog and 1 gilt, farrowed on or after 1st March, 1927, by a pure bred sire and out of a pure bred dam).—*First Prize* (the "Bledisloe" Bacon Challenge Cup) to H. H. Pickford (Large White and Large Black). *Second Prize* (£3) to J. H. Ismay (Large White and Berkshire). *Third Prize* (£2) to The Cathedral Dairy (Large White and Middle White).

Class 90.—COLONIAL (4 sides).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to The Farmers' Co-operative Bacon Factory, Ltd.

HAMS.

Class 91.—FOUR PALE DRIED HAMS (long cut, of Winter or Spring cure, not over 14 lbs. weight).—*First Prize* (Silver Medal) to T. Foster. *Second Prize* (Bronze Medal) to W. H. Smart & Co., Ltd.

Class 92.—FOUR PALE DRIED HAMS (long cut, of Winter or Spring cure, over 14 lbs. weight).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to W. H. Smart & Co., Ltd.

Class 93.—FOUR SMOKED HAMS (long cut, mild cured, not over ten weeks cured, not over 15 lbs. weight).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to J. A. Hunter & Co., Ltd.

Class 94.—FOUR PALE DRIED HAMS (long cut, mild cured, not over ten weeks cured, over 15 lbs. weight).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to W. H. Smart & Co., Ltd.

Class 95.—SELLING CLASS FOR TWO HAMS, ANY VARIETY.—*First Prize* (£2), *Second Prize* (£1) and *Third Prize* (10s.) to W. H. Smart & Co., Ltd.

BUTTER.

Class 96.—SLIGHTLY SALTED. (Open only to farmers, their wives, sons and daughters, occupying not exceeding 100 acres, and who have never won a prize in the Butter Classes at any of the Association's Shows; 2 lbs. in 1-lb. lumps, brick shape).—*First Prize* (£3) to Mrs. Dennis. *Second Prize* (£2) to Mrs. J. Ward. *Third Prize* (£1) to Mrs. E. Hill. *Fourth Prize* (10s.) to Mrs. B. M. Walkden. *Fifth Prize* (5s.) to Mrs. M. Gill.

Class 97.—PERFECTLY FREE FROM SALT (the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1-lb. lumps, brick shape).—*First Prize* (£3) to J. Northcott. *Second Prize* (£2) to Mrs. J. Way. *Third Prize* (£1) to Mrs. H. Watson. *Fourth Prize* (10s.) to Miss Jessie M. Seldon. *Fifth Prize* (5s.) to Miss M. Wesson.

Class 98.—SLIGHTLY SALTED (the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1-lb. lumps, brick shape).—*First Prize* (£3) to Mrs. Howard Palmer. *Second Prize* (£2) to Mrs. B. M. Walkden. *Third Prize* (£1) to Mrs. J. Way. *Fourth Prize* (10s.) to Mrs. L. Matthews. *Fifth Prize* (5s.) to Miss Jessie M. Seldon.

Class 99.—PERFECTLY FREE FROM SALT (the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1-lb. lumps, brick shape).—*First Prize* (£3) to Mrs. G. Blackler. *Second Prize* (£2) to Mrs. M. Gill. *Third Prize* (£1) to Capt. Livingstone Learmonth. *Fourth Prize* (10s.) to Mrs. W. Irving. *Fifth Prize* (5s.) to Miss Jessie M. Seldon.

Class 100.—SLIGHTLY SALTED (the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1-lb. lumps, brick shape).—*First Prize* (£3) to Mrs. M. Gill. *Second Prize* (£2) to Mrs. J. Way. *Third Prize* (£1) to Mrs. G. Blackler. *Fourth Prize* (10s.) to Capt. Livingstone Learmonth. *Fifth Prize* (5s.) to Miss A. Bray.

Class 101.—SLIGHTLY SALTED, to be made from Scalded Cream only (2 lbs. in 1-lb. lumps, brick shape).—*First Prize* (£3) and the Lord Mayor's Champion Cup to Mrs. G. Blackler. *Second Prize* (£2) to J. Northcott. *Third Prize* (£1) to Mrs. L. Matthews. *Fourth Prize* (10s.) to Miss L. T. Hare. *Fifth Prize* (5s.) to Mrs. Dennis.

Class 102.—SLIGHTLY SALTED (12 lb. boxes of 12 bricks).—*First Prize* (£3) to Macamore Co-operative Creamery. *Second Prize* (£2) to Ardagh Co-operative Dairy Society, Ltd. *Third Prize* (£1) to Glenwilliam Co-operative Dairy Society, Ltd. *Fourth Prize* (10s.) to Ballyrashane Co-operative Agricultural & Dairy Society, Ltd.

Class 103.—FREE FROM SALT (24 lb. boxes of 12 rolls).—*First Prize* (£3) to Ballyrashane Co-operative Agricultural & Dairy Society, Ltd. *Second Prize* (£2) to Glenwilliam Co-operative Dairy Society, Ltd. *Third Prize* (£1) to Townrafulla Co-operative Creamery, Ltd. *Fourth Prize* (10s.) to Ardagh Co-operative Dairy Society, Ltd.

Class 104.—MILD CURED (slightly salted, in 24 lb. boxes of 24 rolls).—*First Prize* (£3) to Solohead Co-operative Agricultural & Dairy Society, Ltd. *Second Prize* (£2) to Ballinfull Co-operative Dairy Society, Ltd. *Third Prize* (£1) to Herbertstown Co-operative Dairy Society, Ltd. *Fourth Prize* (10s.) to Newmarket Dairy Co., Ltd.

Class 105.—CURED (slightly salted, 28 lbs.).—*First Prize* (£3) to Shanagolden Co-operative Dairy Society, Ltd. *Second Prize* (£2) to Mitchelstown Co-operative Creamery. *Third Prize* (£1) to Cappamore Co-operative Agricultural & Dairy Society. *Fourth Prize* (10s.) to Greybridge Co-operative Creamery, Ltd.

Class 106.—CURED (56 lbs.).—*First Prize* (£3) to Mitchelstown Co-operative Creamery. *Second Prize* (£2) to Solohead Co-operative Agricultural & Dairy Society. *Third Prize* (£1) to Kilross Co-operative Dairy Society. *Fourth Prize* (10s.) to Riverstown Co-operative Agricultural & Dairy Society, Ltd.

Class 107.—TWO POUNDS, made up in the most attractive form for table use.—*First Prize* (£3) to Miss M. N. Blackman. *Second Prize* (£2) to Mrs. R. J. Dunstan. *Third Prize* (£1) to H. C. Hambro.

Class 108.—FANCY OR ORNAMENTAL DESIGN, with foliage or other extraneous decoration.—*First Prize* (£5) to Miss P. Mudd.

COLONIAL BUTTER.

Class 109.—SALTED (56 lbs.).—*First Prize* (Gold Medal) to Warwick Dairy Co. *Two Second Prizes* (Silver Medals) to Dungog Co-operative Dairy Co., Ltd., and Shoal Lake Creamery. *Two Third Prizes* (Bronze Medals) to Pambula Co-operative Creamery & Dairy Co., Ltd., and St. Boniface Creamery.

Class 110.—UNSALTED (56 lbs.).—*First Prize* (Gold Medal) to South Australian Farmers' Co-operative Union Ltd. (Milang Branch). *Two Second Prizes* (Silver Medals) to Alstonville Co-operative Dairy Society, Ltd., and South Australian Farmers' Co-operative Union, Ltd. (Adelaide Branch). *Two Third Prizes* (Bronze Medals) to Coraki Co-operative Society, Ltd., and Denman Dairy Co., Ltd.

COLLECTION OF COLONIAL DAIRY PRODUCE.

Class 111.—To include Bacon, Dead Poultry and Eggs.—No entry.

CREAM.

Class 112.—CLOTTED.—*First Prize* (£2 2s. and Silver Medal) to Mrs. F. M. Cosham. *Second Prize* (£1 1s. and Bronze Medal) to Mrs. W. H. Hannaford.

Class 113.—OTHER THAN CLOTTED.—*First Prize* (£2 2s. and Silver Medal) to Major F. P. P. Soper. *Second Prize* (£1 1s. and Bronze Medal) to Hammett's Dairies, Ltd.

BOTTLED FRUITS, VEGETABLES AND JAMS.

Class 114.—SIX BOTTLES OF SOFT FRUIT, of not less than 4 Varieties (Rhubarb admitted).—*First Prize* (£2) to Miss C. R. Swain. *Second Prize* (£1) to Mrs. K. M. Wintour. *Third Prize* (10s.) to Miss D. E. Williams.

Class 115.—SIX BOTTLES OF STONE FRUIT, of not less than 4 Varieties (Apples and Pears admitted).—*First Prize* (£2) to Miss D. E. Williams. *Second Prize* (£1) to J. E. Gunn. *Third Prize* (10s.) to Mrs. E. Caddick.

Class 116.—SIX BOTTLES OF FRUIT, SOFT AND STONE, of not less than 2 Varieties of each. To be shown in bottles suitable for trade. Price of bottles, without contents, to be placed on one bottle.—*First Prize* (£2) to Mrs. K. M. Wintour. *Second Prize* (£1 and Silver Medal) to Miss C. R. Swain.

Class 117.—THREE BOTTLES OF SOFT FRUIT, distinct.—*First Prize* (£1) to Miss C. R. Swain. *Second Prize* (10s.) to Miss F. L. Wilkinson. *Third Prize* (7s. 6d.) to Miss D. E. Williams.

- Class 118.—THREE BOTTLES OF STONE FRUIT, distinct.—*First Prize* (£1) to Cathedral Dairy. *Second Prize* (10s.) to D. Turney. *Third Prize* (7s. 6d.) to Mrs. J. Pantall.
- Class 119.—THREE BOTTLES OF STONE OR SOFT FRUIT, distinct. Preserved in Syrup.—*First Prize* (£1) to Miss C. R. Swain. *Second Prize* (10s.) to Mrs. Turney. *Third Prize* (7s. 6d.) to Mrs. E. Caddick.
- Class 120.—SIX BOTTLES OF VEGETABLES, of not less than 4 Varieties (Tomatoes admitted).—*First Prize* (£2) to Mrs. E. Caddick. *Second Prize* (£1) to Miss D. E. Williams. *Third Prize* (10s.) to Miss C. R. Swain.
- Class 121.—THREE BOTTLES OF VEGETABLES, distinct.—*First Prize* (£1) to Mrs. Howard Palmer. *Second Prize* (10s.) to Miss C. R. Swain. *Third Prize* (7s. 6d.) to Mrs. J. Pantall.

JAMS.

- Class 122.—THREE JARS OF JAM (1-lb. each, dissimilar, any Variety). *First Prize* (£1) to Mrs. J. Pantall. *Second Prize* (10s.) to J. E. Gunn. *Third Prize* (7s. 6d.) to Mrs. K. M. Wintour.
- Class 123.—CO-OPERATIVE EXHIBIT OF BOTTLED FRUITS, VEGETABLES, JAMS, FRUIT JELLIES, PICKLES AND CHUTNEYS. Open only to Women's Institutes, and no one Member to contribute more than two items in the exhibit. To consist of 3 bottles of Soft Fruit, 3 bottles of Stone Fruit, 3 bottles of Vegetables, 3 1-lb. jars of Jam or Fruit Jelly, 3 jars of Pickles or Chutney. All exhibits to be shown in glass containers and to be of not less than two Varieties.—*First Prize* (£5) to Loose Women's Institute. *Second Prize* (£3) to Snape Women's Institute. *Third Prize* (£2) to Cirencester Women's Institute.

HONEY, WAX, &c.

- Class 124.—SIX JARS OF EXTRACTED LIGHT-COLOURED HONEY, gathered during 1927 (1 lb. each, approximate weight).—*First Prize* (£1) to D. Jones & Son. *Second Prize* (15s.) to F. Humphreys. *Third Prize* (12s. 6d.) to W. J. Chant. *Fourth Prize* (10s.) to G. F. Mence.
- Class 125.—SIX JARS OF EXTRACTED MEDIUM-COLOURED HONEY, gathered during 1927, excluding Heather Honey (1 lb. each, approximate weight). *First Prize* (£1) to J. S. Leigh. *Second Prize* (15s.) to W. J. Goodrich. *Third Prize* (12s. 6d.) to H. G. Ingram. *Fourth Prize* (10s.) to W. J. Goodrich.
- Class 126.—SIX JARS OF EXTRACTED DARK-COLOURED HONEY, gathered during 1927, excluding Heather Honey (1 lb. each, approximate weight).—*First Prize* (£1) to J. S. Leigh. *Second Prize* (15s.) to W. J. Goodrich. *Third Prize* (12s. 6d.) to E. C. R. White.
- Class 127.—SIX JARS OF GRANULATED HONEY, of any year, excluding Heather Honey (1 lb. each, approximate weight).—*First Prize* (£1) to Miss G. Robinson. *Second Prize* (10s.) to F. Humphreys. *Third Prize* (7s. 6d.) to W. J. Goodrich.
- Class 128.—SIX SECTIONS OF COMB HONEY, excluding Heather Honey, gathered during 1927 (size 4½ by 4½, approximate weight, 1 lb. each).—*First Prize* (£1) to W. M. Robson. *Second Prize* (15s.) to J. Pollard. *Third Prize* (10s.) to F. Humphreys.
- Class 129.—DISPLAY OF HONEY AND HONEY PRODUCTS, in any form, and of any year, staged on space not exceeding 4 ft. by 4 ft. maximum, height to be about 4 ft. above the table. The gross weight to be stated. *First Prize* (£5) to F. Humphreys.

- Class 130.—ONE SHALLOW-FRAME OF COMB HONEY, suitable for extracting.—*First Prize* (15s.) and *Second Prize* (10s.) not awarded. *Third Prize* (7s. 6d.) to F. Humphreys.
- Class 131.—BEES' WAX, not less than 2 lbs. in not more than two cakes, the produce of the Exhibitor's apiary; extracted and cleaned by the Exhibitor or his assistants.—*First Prize* (15s.) to Mrs. Edgell. *Second Prize* (10s.) to Miss G. Robinson. *Third Prize* (7s. 6d.) to D. Jones & Son.
- Class 132.—INTERESTING AND INSTRUCTIVE EXHIBIT OF A PRACTICAL OR SCIENTIFIC NATURE CONNECTED WITH BEE CULTURE, not mentioned in the foregoing classes.—No entry.
- Class 133.—THREE VESSELS OF COLONIAL EXTRACTED HONEY, as imported.—*First Prize* (Silver Medal) to Ontario Honey Producers' Co-operative, Ltd. *Second Prize* (Bronze Medal) to Ontario Beekeepers' Association.

ROOTS.

- Class 134.—SIX SPECIMENS OF GLOBE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to W. Jones. *Second Prize* (£2) to J. James. *Third Prize* (£1) to D. Jervis.
- Class 135.—SIX SPECIMENS OF GOLDEN TANKARD MANGOLDS, YELLOW-FLESHED, drawn from a crop of not less than two acres.—*First Prize* (£3) to W. Watts. *Second Prize* (£2) to J. James. *Third Prize* (£1) to J. Waldron.
- Class 136.—SIX SPECIMENS OF INTERMEDIATE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to T. Goddard. *Second Prize* (£2) to R. Thomas. *Third Prize* (£1) to W. Jones.
- Class 137.—SIX SPECIMENS OF SWEDES, PURPLE TOP, drawn from a crop of not less than two acres.—*First Prize* (£3) to J. James. *Second Prize* (£2) to W. S. Webster. *Third Prize* (£1) to J. H. Hedley.
- Class 138.—SIX SPECIMENS OF SWEDES, BRONZE TOP OR GREEN TOP, drawn from a crop of not less than two acres.—*First Prize* (£3) to R. C. Lee. *Second Prize* (£2) to W. Humphreys. *Third Prize* (£1) to W. Hutcheson.
- Class 139.—SIX SPECIMENS OF TURNIPS, WHITE-FLESHED, drawn from a crop of not less than two acres.—*First Prize* (£3) to W. Humphreys. *Second Prize* (£2) to J. H. Hedley. *Third Prize* (£1) to Sir R. Baker.
- Class 140.—SIX SPECIMENS OF TURNIPS, YELLOW-FLESHED, drawn from a crop of not less than two acres.—*First Prize* (£3) to W. D. Clark. *Second Prize* (£2) to J. James. *Third Prize* (£1) to R. Forrest.
- Class 141.—THREE SPECIMENS OF CABBAGE, drawn from a crop of not less than two acres.—*First Prize* (£3) to G. Gadsby. *Second Prize* (£2) to F. S. Mee. *Third Prize* (£1) to J. A. Wright.
- Class 142.—SIX SPECIMENS OF KOHL-RABI, drawn from a crop of not less than two acres.—*First Prize* (£3) to Walthamstow Urban District Council. *Second Prize* (£2) to P. Perry. *Third Prize* (£1) to T. Chettle.
- Class 143.—THREE SPECIMENS OF KALE, MARROW STEM, drawn from a crop of not less than two acres.—*First Prize* (£3) to G. Andrews. *Second Prize* (£2) to P. E. Mead. *Third Prize* (£1) to W. Watts.
- Class 144.—COLLECTION OF ROOTS, &c., FOR CATTLE FEEDING IN WINTER (to consist of six specimens of not exceeding ten Varieties, in as many distinct types as possible).—*First Prize* (£5) to P. Perry. *Second Prize* (£3) to W. Watts. *Third Prize* (£2) to J. James.

INVENTIONS.

- Class 145.—ANY NEW APPARATUS OR INVENTION RELATING TO THE DAIRY INDUSTRY, OR ONE SHOWING DISTINCT AND PRACTICAL IMPROVEMENT, ESPECIALLY AS TO SAVING OF LABOUR, not eligible for competition in any other Class and not previously exhibited in competition at the Dairy Show.—Gold Medal to G. S. Clayton for improved "Dead-on" filling and measuring machine. Silver Medal to Dairy Supply Co., Ltd., for improved cream cooler; C. D. Gabell, Ltd., for bottle filling and measuring machine. Bronze Medal to Perfect Dairy Machines (England), Ltd., for "Perfect" automatic non-foam can filling and measuring machine; Albro Fillers & Engineering Co., Ltd., for pneumatic capping head for inserting milk bottle disc.
- Class 146.—SMALL PLANT FOR WASHING AND STERILIZING BOTTLES, and suitable for Farmers with Herds not exceeding 30 Cows.—*First Prize* (£3 and Silver Medal) to G. S. Clayton. *Second Prize* (£2 and Bronze Medal) to Dairy Supply Co., Ltd.
- Class 147.—REFRIGERATING COMPRESSOR PLANT, capable of reducing the temperature of milk from 100° F. to 40° F. over the cooler with cold room to retain the milk at this temperature. Suitable for Farmers with Herds of 30 to 50 Cows. *First Prize* (£3 and Silver Medal) to A. G. Enock & Co., Ltd.

JUNKET-MAKING CONTESTS.

- Class 148.—JUNKET MADE WITH CREAM AND MILK. Open only to those who have never won a First Prize for Junket-making at any Shows of the British Farmers' Association.
- SECTION A.—*First Prize* (£2) to Miss K. Rowe. *Second Prize* (£1) to Miss R. E. Mitchell. *Third Prize* (10s.) to Miss J. B. Worth.
- SECTION B.—*First Prize* (£2) to Miss R. Hancock. *Second Prize* (£1) to Miss E. Waters. *Third Prize* (10s.) to Mrs. W. Hawkey.
- SECTION C.—*First Prize* (£2) to Mrs. M. Simmons. *Second Prize* (£1) to Miss D. Cane. *Third Prize* (10s.) to Miss M. Sandercock.
- Class 149.—CHAMPION CONTEST. Open to First Prize Winners in preceding sections and at previous Shows of the British Dairy Farmers' Association, Champions of any year excepted.—*Prize* (Silver Medal) to Miss R. Hancock.

BUTTER-MAKING CONTESTS.

- Class 150.—Open to those who have never won a Prize at any Show wherever held.
- SECTION A.—*First Prize* (£3) to Mrs. R. J. Dunstan. *Second Prize* (£2) to Miss D. E. Browning. *Third Prize* (£1) to Miss E. Williams.
- SECTION B.—*First Prize* (£3) to Miss M. Morgan. *Second Prize* (£2) to Miss E. L. Tunkiss. *Third Prize* (£1) to A. C. Castle.
- SECTION C.—Equal *First Prize* (£2 10s. each) to Miss T. Simmons and Miss W. M. Trethewey. *Third Prize* (£1) to Mrs. W. Hawkey.
- Class 151.—Open to Students who have attended Classes at the British Dairy Institute, Reading, for not less than one month during the past two years.—*First Prize* (£3) to Miss E. Waters. *Second Prize* (£2) to Miss M. Fleet. *Third Prize* (£1) to Miss D. S. Lindsay.

Class 152.—Open Contest for Men and Women.

SECTION A.—*First Prize* (£3) to Miss E. Challenger. *Second Prize* (£2) to Miss M. West. *Third Prize* (£1) to Mrs. W. Hawkey.

SECTION B.—*First Prize* (£3) to Miss R. Hancock. *Second Prize* (£2) to Miss K. Davis. *Third Prize* (£1) to Mrs. A. Morgan.

SECTION C.—*First Prize* (£3) to Miss F. Seymour. *Second Prize* (£2) to Miss L. Phillips. *Third Prize* (£1) to Miss K. Rowe.

SECTION D.—*First Prize* (£3) to Miss M. Morgan. *Second Prize* (£2) to Mrs. R. J. Dunstan. *Third Prize* (£1) to Miss S. Davies.

SECTION E.—*First Prize* (£3) to Miss J. Ridler. *Second Prize* (£2) to Miss A. E. White. *Third Prize* (£1) to Miss M. Blissett.

Class 153.—Open to Winners of First Prizes in Classes 150, 151 and 152.—*First Prize* (£3 and Silver Medal) to Miss R. Hancock. *Second Prize* (£2) to Miss J. Ridler. *Third Prize* (£1) to Miss E. Challenger.

Class 154.—CHAMPION CONTEST. Open to Winners of First Prizes in Classes 150 to 153 or at any of the last five Shows of the British Dairy Farmers' Association. Champions of any year excepted.—*First Prize* (Gold Medal) to Miss D. E. Nicholas. *Second Prize* (£3) to Miss E. Parry. *Third Prize* (£2) to Miss F. Jones.

MILKERS' CONTESTS.

Class 155.—Open to Men and Women of 18 years and over.—*First Prize* (£7) to J. M. Done. *Second Prize* (£4) to Miss J. Johnson. *Third Prize* (£3) to A. J. Barnett. *Fourth Prize* (£2) to Miss M. N. Blackman. *Fifth Prize* (£1) to J. Marking.

Class 156.—Open to Boys and Girls under 18 years.—*First Prize* (£7) to A. G. Hopwood. *Second Prize* (£4) to Miss J. Grimmer. *Third Prize* (£3) to A. E. French. *Fourth Prize* (£2) to W. T. Challoner. *Fifth Prize* (£1) to Miss E. Maughan.

Class 157.—CHAMPION CONTEST. Open to Winners of First Prizes in Classes 155 and 156, and at any of the last three Shows of the British Dairy Farmers' Association. Champions of any year excepted.—Prize ("Howard" Cup, Gold Medal and £2) to J. M. Done.

COW-JUDGING CONTEST.

Class 158.—Open to Teams of Students from Agricultural Colleges, Farm Institutes, and County Council Classes.—Cancelled owing to Foot and Mouth Disease.

THE OBJECTS OF THE BRITISH DAIRY FARMERS' ASSOCIATION

are the improvement of

DAIRY STOCK AND DAIRY PRODUCE,

by encouraging the Breeding and Rearing of Stock for the special purpose of the Dairy; a larger and better production of Milk, Butter, Cheese, and Eggs; the Erection of Improved Dairy Buildings, and the Invention of New or Improved Dairy Utensils, Machinery, Implements, and Scientific Appliances. The Association also stimulates the Breeding and Rearing of Poultry, &c. By means of Papers in the Society's *Journal* (published annually), Annual Conferences in different dairy districts, Lectures, and Discussions, and in other ways, efforts are continually being made to disseminate a more thorough knowledge of Dairy husbandry. Moreover, prompt action is taken by the Association for the protection of the interests of Dairy Farmers in the event of their being threatened by legislation or by Departmental Orders.

Prizes to the value of about £3,500 are annually offered for competition at the Dairy Show, held at the Royal Agricultural Hall, Islington, London.

It is difficult to over-estimate the importance and need of greater attention being paid to the Dairy industry. It is admitted that by improved modes of managing Milk and its products, the wealth obtained from the Milch Cows of the country could be increased most materially. The Council, therefore, appeal to Agriculturists of all classes, and Dairy Farmers in particular, to become Members of the Association, and practically aid in developing its usefulness.

The advantages of Membership comprise :—

- 1.—A free pass to all the Society's Dairy Shows, available each day during the Exhibition, with the privilege of admitting free (by ticket) a friend on any one day.
- 2.—The privilege of participating, at specially low charges, in the Dairy Conferences organized by the Association at home or abroad.
- 3.—The Exhibition of Live Stock, Dairy Produce, and Utensils (for competition) at a reduced scale of fees to Life Members, and to Annual Members subscribing £1 per annum whose subscription for the past year and current year is paid. A reduction of 10 per cent. is allowed to Standholders whose Membership is of 3 years standing.
- 4.—A copy (free by post) of the *Journal* of the Association, published annually.
- 5.—Analyses by the Analytical and Consulting Chemist, at low fees, of samples of milk, cream, butter, cheese, feeding stuffs, water, soil, manures, &c., and advice on dairy matters connected with his Department.

- 6.—Bacteriological examination of dairy produce, &c., at reduced fees.
- 7.—Examinations by the Consulting Pathological Bacteriologist for particular pathogenic or disease-producing organisms.
- 8.—Professional advice and assistance at a reduced scale of charges in any case of disease among the live stock of the farm.
- 9.—In any case of apparent hardship in connection with the administration of the Model Milk Clauses, Members are recommended to at once send details of such case to the Secretary, who will submit the matter to the Committee appointed to deal with such matters, after which advice and assistance will be given by the Association.

The Annual Subscription is £1, but Dairy Instructors and Students and full-time Secretaries and Recorders of Milk Recording Societies are admitted on payment of 10s. 6d. per annum. The latter sum entitles Members to all privileges, except the reduced fees for exhibition at the Shows. Life Membership, £15.

Members' Chemical Privileges.

Free Analysis.—Each member, whose subscription for the current year is paid, is entitled to one analysis of a dairy product (paragraphs 1 to 9 below) free of charge. A stamped addressed envelope must be forwarded with the sample for the return of the report of the analysis.

Further analyses will be made by the Association's Consulting Chemist at the following reduced fees:—

1.—MILK (Fresh).						£	s.	d.
Estimation of Fat and Total Solids...	...	...	...	...	...	0	1	0
Estimation of Fat, Casein, Albumen, Sugar, and Ash	...	...	...	...	...	0	10	0
2.—MILK (Sour).								
Estimation of Fat and Total Solids	...	...	...	...	...	0	5	0
3.—SKIMMED MILK.								
Estimation of Fat and Total Solids...	...	...	...	...	...	0	5	0
4.—CONDENSED MILK.								
Estimation of Fat	...	...	...	...	...	0	5	0
Estimation of Fat, Casein, and Solids	...	...	...	...	...	0	10	0
Estimation of Cane Sugar (extra)	...	...	...	...	...	0	5	0
5.—HUMANISED MILK.								
Complete Analysis	...	...	...	...	...	1	1	0
6.—CREAM.								
Estimation of Fat	...	...	...	...	...	0	5	0
Estimation of Fat, Casein, and Solids	...	...	...	...	...	0	12	6
Examination for Foreign Fats (extra)	...	...	...	...	...	0	10	6
7.—BUTTER.								
Estimation of Water, Fat, Casein, and Ash	...	...	...	...	...	0	10	0
Examination for Foreign Fats (extra)	...	...	...	...	...	0	10	6
8.—CHEESE.								
Estimation of Water, Fat, Casein, and Ash	...	...	...	...	...	0	10	6
Examination for Foreign Fats (extra)	...	...	...	...	...	0	10	0
9.—RENNET.								
Examination of Strength	...	...	...	...	...	0	5	0

						£	s.	d.
10.—CAKES AND MEALS.								
	Estimation of Oil only	...	...	...	...	0	5	0
	Estimation of Oil, Albuminoids, Carbo-hydrates, &c.	...	...	...	...	0	15	0
11.—GRASS, SILAGE, ROOTS, &c.								
	Estimation of Oil, Albuminoids, Carbo-hydrates, &c.	...	...	...	...	1	10	0
12.—MANURES.								
	Estimation of Soluble Phosphoric Acid	...	...	...	...	0	5	0
	Estimation of Soluble and Insoluble Phosphoric Acid	...	...	...	...	0	7	6
	Estimation of Citric Soluble Phosphoric Acid	...	...	...	...	0	7	6
	Estimation of Nitrogen	...	...	...	...	0	5	0
	Estimation of Potash	...	...	...	...	0	7	6
13.—SOIL.								
	Estimation of Lime	...	...	...	...	0	5	0
	Analysis and Report	...	...	...	...	2	2	0
14.—WATER.								
	Analysis for Drinking or Dairy Purposes	...	...	...	...	1	1	0
15.—POISONS.								
	Examination of a Substance for Mineral Poisons	...	...	...	...	2	2	0
	Examination for Organic Poisons (Alkaloids, &c.)	...	...	...	...	3	3	0
16.—CIDER AND FERMENTED DRINKS.								
	Estimation of Alcohol	...	...	...	...	0	7	6
	Estimation of Alcohol, Sugar, Acidity, &c.	...	...	...	...	0	15	0
17.—PRESERVATIVES.								
	Examining a Substance for Boracic Acid or Salicylic Acid, &c., for each Substance sought	...	...	...	...	0	2	6
	Estimation of the quantity of Boracic Acid	...	...	...	...	0	10	6
18.—CONSULTATION.								
	For Letter in reply to Enquiry	...	...	...	...	Free		
	For Report on a Subject	...	...	...	...	0	7	6
	For Personal Interview	...	...	...	...	0	10	6
	For Special Consultation	...	...	...	...	1	1	0

NOTE.—The Consulting Chemist will be prepared to quote reduced terms to members requiring a number of analyses at frequent intervals.

Instructions for Taking Fair Samples for Analysis.

Dairy Produce.—Milk should be sent in a well-corked 8-oz. clear bottle. The milk should quite fill the bottle. Butter or cheese, about 8 ounces; the former in a gallipot well tied down.

Soils.—A block of soil about four or five inches square, and nine inches deep, should be sent in a strong box by rail.

Artificial Manures.—Take a handful of manure out of at least half a dozen bags, mix these rapidly and thoroughly, breaking down all lumps. Forward about a pound of the mixture in a tin box, and retain the remainder. Samples of manure should be sent immediately after the delivery of the bulk, and before settling the account. All manures should be bought subject to analysis.

Feeding Materials.—Feeding cakes, meals, or grains: about a pound should be sent in a bag or box. Grass and hay: a bundle of a few pounds weight. Silage: a six-inch cubic block, packed closely in a box to keep it compressed.

Waters.—A Winchester quart glass-stoppered bottle should be procured from a druggist, well washed out with the water, then completely filled, the stopper tied securely down, and the bottle packed in a box and sent by rail.

N.B.—In order to prevent disappointment, the Chemist requests that, as far as possible, Members desiring to hold a personal consultation should make an appointment by letter. Between 10 and 4 are the hours most convenient. The fees for analyses of artificial manures and feeding stuffs are only applicable to Members who are not commercially engaged in their manufacture or sale. All communications intended for the Analytical and Consulting Chemist must be addressed direct to Dr. T. J. DRAKELEY, Ph.D., M.Sc., F.I.C., F.C.S., M.I.M.E., 28, Russell Square, London, W.C.1.

Members' Bacteriological Privileges.

Samples of dairy produce, &c., submitted for a bacteriological count, or for examination for *Bacillus Coli*, &c., should be forwarded to Dr. T. J. DRAKELEY, Ph.D., M.Sc. F.I.C., F.C.S., M.I.M.E., 28, Russell Square, W.C.1.

Examinations will be made at the following fees:—

MILK.	£	s.	d.
Bacteriological Examination of "Certified," "Grade A," or "Pasteurised" Milk under the Milk (Special Designations) Order, 1922	0	10	6
Cultural Examination for a particular organism	2	2	0
CREAM, BUTTER, CHEESE.			
Cultural Examination for a particular organism	2	2	0

Directions for Sending Samples.

Samples of milk (one pint) and cream (half pint) should be forwarded in wide-mouthed stoppered bottles which have previously been thoroughly cleaned, and then rinsed several times with very hot, almost boiling, water.

Butter is best sent in a $\frac{1}{2}$ -lb. brick or roll, just as it was made up, wrapped in grease-proof paper, and packed in a box.

If the *Cheese* is small, send a whole one; otherwise forward a square block of not less than one pound, and not a wedge-shaped piece. Wrap in grease-proof paper and pack in a box.

Examinations for Pathogenic Organisms.

EXAMINATIONS BY DR. ANDREWES, Pathological Laboratory,
St. Bartholomew's Hospital, London, E.C. 1.

£ s. d.

Cultural and experimental examination for a particular pathogenic organism	I	I	O
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Cultural and experimental examination for a particular pathogenic organism	2	2	0
--	-----	-----	-----	-----	-----	---	---	---

Cultural and experimental examination for a particular pathogenic organism	2	2	0
---	---	---	---

Members of the Association who require professional assistance in any case of disease among their animals must apply direct to the Consulting Veterinary Surgeon, Professor G. H. WOOLDRIDGE, Royal Veterinary College, Camden Town, London, N.W. 1, whose scale of charges is as follows:—

	£	s.	d.
Personal Consultation	0	10	6
Post-mortem Examination and Report	0	10	6
Consultation by Letter	0	5	0
Visit and Report, in case of an outbreak of disease, in addition to personal and travelling expenses, per day	2	2	0

Members' Botanical Privileges.

The Council have fixed the following rates of charge for the examination of Plants and Seeds for the *bonâ fide* and individual use and information of Members of the Association (not being Seedsmen), who are particularly requested to mention the kind of examination they require, *and to quote its number in the subjoined Schedule.*

No.	£	s.	d.
1.—A Report on the purity, and amount or nature of foreign materials, of a sample of seed	0	1	0
2.—A Report on the perfectness and germinating power of a sample of seed	0	1	0
Nos. 1 and 2 together	0	1	6
3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention	0	1	0
4.—Report on any disease affecting farm crops	0	1	0
5.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value	0	4	0

Instructions for Selecting and Sending Samples.

The utmost care must be taken to secure a fair honest sample. When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. Grass seeds should be sent at least four weeks, and clover seeds two weeks before they are to be used. In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel. Specimens of diseased plants or of parasites should be forwarded as fresh as possible—either in a bottle, or packed in tinfoil or oil silk. All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstance (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

The charge for examination must be paid, in Postage Stamps or otherwise, at the time of application, and the carriage of all parcels must be prepaid. It must be distinctly understood that *no notice can be taken* of any application unless it is accompanied by the proper fee.

THE BRITISH DAIRY INSTITUTE, READING.

The British Dairy Institute was established at Aylesbury in 1888, by the British Dairy Farmers' Association, and several hundred Students were successfully trained there in different branches of dairy work. In order that Students might have an opportunity of combining with the practical study of dairying a more complete scientific instruction, the Institute was, in 1896, moved to Reading, and placed under the management of a Committee representing the British Dairy Farmers' Association and the University College, Reading.

The Institute contains large milk-receiving, butter-making, and milk-testing rooms; rooms for the manufacture of pressed, unpressed, and soft cheeses; and rooms for the ripening and drying of different varieties of cheese; besides reading, lecture, and common rooms. It is equipped with the best modern apparatus for the manufacture of dairy produce, including power-driven separating and butter-making plant, and cold storage plant.

The instruction given is both practical and theoretical, and is arranged to suit the requirements of those who need either elementary or advanced dairy instruction, or who wish to perfect themselves in the manufacture of any special variety of dairy produce. Instruction is provided for students who wish to specialize in Bacteriology or Chemistry applied to dairying.

The Institute is open throughout the year, except during the Winter Vacation of eight weeks, which commences about the middle of November.

The Courses at the Institute are open to men and women above the age of 16 years. Students may join at any time while the Institute is open, and for any period not less than a week, but those who desire to take a thorough short course in butter-making or cheese-making are recommended to attend the Six Months' or Three Months' Joint Course in Dairying.

The manufacture of hard-pressed and soft cheeses is taught during the whole of the time when the Institute is open, but Stilton and other blue-veined varieties are not made until May.

Instruction is given in butter-making, clotted-cream making, the testing and analysis of milk, the management of various types of separators, the handling and care of milk, and the preparation of starters, &c. Lectures and demonstrations are usually given in the afternoons, the mornings being chiefly devoted to practical dairy work.

Practical and theoretical instruction in butter-making and cheese-making (including hard-pressed, blue-veined, and soft cheese), £1 per week; £10 for three months; £18 for six months.

Practical and theoretical instruction in butter-making only, 10s. per week (or part of week).

A full Prospectus will be sent on application to the Secretary, British Dairy Institute, Reading.

FRED J. BULL,
Secretary, B.D.F.A.

28, Russell Square, London, W.C. 1.

Fifty-second Half-yearly Report of the Council presented to the Members at the Meeting held at the Dairy Show, Royal Agricultural Hall, Islington, N. 1, on Wednesday, October 19th, 1927.

IN welcoming the members to the Fifty-second Half-yearly Meeting, the Council is gratified in being able to report continued progress in the Association's affairs. One hundred and seventy new members have been enrolled since the last Dairy Show, but it still behoves all who have the dairying interest at heart to secure new members and thus help towards placing the Association in a position to speak as one voice upon all matters affecting the welfare of the industry in the service of which it has striven for 50 years. The vital problems by which the dairy farmer to-day finds himself beset can only be successfully grappled with by organised action through such a body as the British Dairy Farmers' Association—an Association unfettered by allegiance to any other cause, and with a policy dictated solely by a consideration of what is best for the dairying industry.

It will be observed from the attached table that the entries for the Annual Dairy Show approximate to the maximum which can be gathered within the four walls of the Royal Agricultural Hall, and this notwithstanding the fact that the Council has in the interests of competitive exhibits restricted the number of non-competitive activities in the Gilbey Hall. For the first time in the history of the Dairy Show classes for Bulls will be missing, progeny classes having taken the place of the usual bull classification. The Council deliberated long over this step, but feeling that the accommodation available was not conducive to the exhibition of the best bulls it decided upon the institution of the progeny classes.

The two new classes which have been instituted for Long-keeping Cheddar and Cheshire Cheeses have been well supported.

Members will be delighted to learn that the Lord Mayor and Lady Mayoress have graciously accepted the Council's invitation to visit the Dairy Show during the afternoon of Tuesday. It is many years since we have been thus honoured, and it is hoped that such visits will be annual.

The Corporation of the City of London has again generously granted 30 guineas towards the prizes, and this sum has been expended upon the purchase of three cups, which are offered for the best exhibits of Cheddar Cheese, Cheshire Cheese and Butter.

The Annual Conference held in Sweden was of a dual purpose character, combining in a pleasurable degree features of an educational and holiday nature. The party, which numbered 37, everywhere met with cordial receptions, and the lavish hospitality offered will be long in fading from the memory of those who had the good fortune to be of the party. The Association was fortunate in having at its disposal the services of Mr. M. de Wachenfelt, Swedish Agricultural Adviser in London, and in recognition of his valuable services the Council has elected him an Hon. Life Member of the British Dairy Farmers' Association.

The programme of the World's Dairy Congress, 1928, will be definitely settled at the end of the present month. The Congress opens in London, where the first sessions will be held. The Central Hall, Westminster, has been selected for the reading of the conference papers, to which the first three mornings will be dedicated. Arrangements have been made for visits to dairy plants and farms in the Metropolitan area during the afternoons of these days. Two days will then be devoted to Reading, where the delegates will visit the National Institute for Research in Dairying and many other places of interest, and round-table conferences of the scientific members among the delegates will take place. Following the Reading visit, the delegates go to Nottingham to visit the Royal Agricultural Show and the Exhibition of Dairy Machinery and Equipment which is to be held in conjunction with the Show. This Exhibition will, undoubtedly, be of great interest to all visitors. A large number of applications for space has been received already, and it is anticipated that all available stands will be booked.

After the Nottingham visit the delegates go up to Scotland, where the last days of the Congress are to be spent and where it will terminate. After the official termination, two tours are being arranged, one through Ireland and the other through the dairying districts of England. These tours will probably last eight days. A large contingent of delegates is already announced from the United States of America, and it is assured that practically every country in the world will be represented at the Congress next year.

The Special Committee appointed by the Council, having received the views of the various Breed Societies with regard to Tuberculin Tested Cattle at the Dairy Show, will again meet during the Show to consider further this vital question.

In view of the success which attended the Sunday service for herdsmen at the last Dairy Show, it was decided to hold a service again this year.

It was with great pleasure the Council learned of Sir Gilbert Greenall's elevation to the Peerage, and it is felt sure that the members of the Association would wish to convey their hearty congratulations through this Report.

Mr. J. Gillard Stapleton having kindly presented a Cup to the Association to be used as an instrument to encourage improved methods of milk production in the counties of England and Wales, the Council decided to institute an Inter-County Clean Milk Competition, the cup to be held for one year by the county making the greatest progress. In addition, £109 is being offered by the Association in money prizes.

Eighteen counties originally entered, but only 11 were able to compete, and the result of the competition will be made known during the Dairy Show.

The Council has appointed Mr. F. J. Bull as the Secretary to the Association, the position having become vacant owing to the lamented death of Mr. B. Ravenscroft. Mr. Bull has been connected with the Association since 1909, during which time he has gained a thorough knowledge of the Dairy Show organisation and other activities of the Association.

The Right Hon. Lord Kenyon, K.C.V.O., has very kindly consented to allow his name to go forward for re-election as President for 1928, and your vote will be asked in support of his candidature.

The following list of Vice-Presidents has been prepared and for which your approval will be asked :—

The Marquis of Crewe, K.G., P.C., D.C.L., Crewe Hall, Crewe.
 Earl of Dartmouth, P.C., K.C.B., Patshull, Wolverhampton.
 Viscount Elveden, C.B., C.M.G., M.P., 11, St. James's Square,
 London, S.W.1.

Lord Strachie, Sutton Court, Pensford, Bristol.

Major Lord O'Hagan, 16, Eaton Square, London, S.W. 1.

Lord Desborough, G.C.V.O., Taplow Court, Taplow, Bucks.

Lord Bledisloe, P.C., K.B.E., Lydney Park, Gloucester.

Lord Daresbury, C.V.O., Walton Hall, Warrington.

S. Palgrave Page, J.P., 27, Oakwood Court, London, W. 14.

G. Titus Barham, Sudbury Park, Wembley, Middlesex.

S. R. Whitley, J.P., Rookwood, Shinfield, Reading.

Major J. A. Morrison, D.S.O., Basildon Park, Reading.

In accordance with the Articles of Association the following members of the Council retire by rotation and have been nominated for re-election :—

Grosvenor Berry, Suffolk.

Lt.-Col. E. W. Caddick, Bedfordshire.

Harold Corrie, Surrey.

R. H. Evans, North Wales.

John Evens, Lincolnshire.

W. J. Golding, Kent.

Miss M. Howard, Northumberland.

James Mackintosh, Berkshire.

J. L. Shirley, Buckinghamshire.

C. W. Walker-Tisdale, Yorkshire.

Robert Wallace, Hertfordshire.

Major S. P. Yates, Oxfordshire.

The following new candidates have been duly proposed and seconded :—

Captain P. D. A. Courtenay (Cattle Breeder), Greenham, Burnham-on-Sea, proposed by R. N. Tory, seconded by E. Debenham.

Mrs. E. L. Houison Craufurd (Cattle Breeder), Dunlop Place, Dunlop, Ayrshire, proposed by A. W. Montgomerie, seconded by Thomas Barr.

George F. Gosney (Secretary to the National Association of Creamery Proprietors and Wholesale Dairymen), 76/86, Strand, London, W.C. 2, proposed by J. F. Phillips, seconded by H. Edwards.

E. G. Harding, J.P. (Farmer), Foscombe Farm, Grittleton, Wilts, proposed by J. A. Brown, seconded by E. G. F. Walker.

A. T. Loram (Farmer), Rosamondford, Aylesbeare, Exeter, proposed by J. P. Bishop, seconded by S. R. Whitley.

William Rice (Hon. Secretary, Poultry Club), 3, Ludgate Broadway, London, E.C. 4, proposed by Lord Daresbury, seconded by Lord Dewar.

Mr. Herbert J. Page, of Messrs. Kemp, Chatteris, Nichols, Sendell & Co., will be proposed as the Association's official Auditor, with Messrs. P. Hay, H. E. Hughes and W. E. Manchester, J.P., as Hon. Auditors.

By order of the Council,

FRED J. BULL,

Secretary.

28, RUSSELL SQUARE,

LONDON, W.C. 1.

October, 1927.

THE FOLLOWING TABLE GIVES COMPARATIVE DETAILS OF THE ENTRIES AT THE DAIRY SHOW WITH THOSE OF THE PAST TWELVE YEARS.

	1912.	1913.	1914.	1915.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.
Cattle	210	286	234	204	292	384	455	515	539	473	470	449	449
Milking and Butter Tests ...	209	265	167	198	334	492	614	760	772	718	700	693	737
Goats... ..	105	110	85	116	115	109	101	91	67	72	48	78	68
Poultry	3,350	3,840	3,089	2,653	2,736	4,317	4,348	4,398	4,685	4,498	4,355	4,352	3,888
Pigeons	2,496	2,467	2,291	2,735	2,760	3,259	3,272	3,208	3,115	3,027	3,094	3,180	3,098
Cheese	343	395	301	271	342	462	406	418	488	486	459	489	688
Bacon and Hams	71	89	67	45	—	34	56	87	89	113	95	94	105
Butter	618	549	371	339	242	286	322	388	401	483	420	430	488
Cream	48	43	27	20	16	19	32	37	33	30	47	30	43
Skin-milk, Bread, &c. ...	83	64	46	65	40	40	No class	No class	No class	No class	No class	No class	No class
Honey, &c.	95	106	126	77	20	49	63	58	92	102	53	65	56
Bottled Fruits and Vegetables	—	—	—	—	—	45	25	26	53	65	33	56	80
New and Improved Inventions... ..	25	41	24	6	23	14	38	30	37	37	54	50	57
Roots	190	190	59	51	80	144	148	183	190	283	269	271	242
Butter-making Contests ...	165	141	97	101	110	86	162	141	129	154	130	131	155
Milkers' Contests	119	137	85	82	77	80	98	44	43	56	51	47	61
Junket-making Contest ...	—	—	—	—	—	7	8	12	23	33	27	28	38
Collection of Colonial Produce	—	—	—	—	—	2	2	3	3	1	2	2	—
Cow-Judging Contest	—	—	—	—	—	—	—	—	7	4	8	10	9
Collection of Produce	—	—	—	—	—	—	—	—	—	8	18	9	9
	8,127	8,723	7,069	6,963	7,187	9,829	10,150	10,399	10,766	10,643	10,333	10,464	10,271

FIFTY-SECOND ANNUAL REPORT OF THE COUNCIL

For the Year ended 31st December, 1927,

PRESENTED TO THE GENERAL MEETING OF
MEMBERS ON WEDNESDAY, MARCH 7th, 1928.

IN presenting this fifty-second Annual Report, the Council has, in the first place, the painful duty of placing on record the death of Lord Kenyon, K.C.V.O., President of the Association, and of Mr. Thomas Willing, a Member of the Council.

Lord Kenyon was first elected President in 1907, and had been closely connected with the Association's work for upwards of 20 years. His kindly advice and untiring efforts in the interests of the dairying industry will be sadly missed by all, particularly by the Members of the Association and Council. Lord Desborough, G.C.V.O., has very kindly consented to act as President for 1928.

Mr. Thomas Willing joined the Association in 1919 and was elected to a seat on the Council in 1924, after having served as the Delegate of the South Devon Herd Book Society from 1922. Mr. P. Stanbury has been elected to fill the vacancy.

Satisfactory progress in the Association's activities has been made during 1927 and the Council is gratified in being able to report that 200 new Members have been elected. The total Membership at the close of 1927 was 1,798, together with 18 Affiliated Societies, as compared with 1,714 in 1926, showing an increase of 84. It is to be regretted that 116 names have been removed from the list of Members

through death, resignations and non-payment of subscriptions, and it behoves all Members to endeavour to interest others who are engaged in the industry and secure their support, thereby adding influence and power to the Association in the difficult problems which it has from time to time to face on their behalf.

As will be seen by the accompanying financial statement, the Association continues to keep its expenditure well within the limits of its annual receipts and the Council is glad to be able to show again a satisfactory balance sheet on the year's working. The year closed with a balance in hand of £1,480 16s. 8d., while the invested funds amounted to £16,344 19s. 2d., the latter being £753 4s. 6d. in excess of 1926.

Notwithstanding the adverse circumstances under which the Dairy Show of 1927 was held, owing to the regulations affecting the movement of cattle necessitating the withdrawal of the cattle and goat sections, the Council has great satisfaction in stating that its exertions to render the Show as popular as possible were crowned with unexpected success. Only a few days were available in which to reorganize the arrangements, and a modern cow shed was erected, together with a large number of up-to-date appliances which proved to be of extraordinary interest.

As a result of the examinations held at the British Dairy Institute, Reading; Studley College, Warwickshire; East Anglian Institute, Chelmsford; and Cannington Court Farm Institute, Bridgwater, 20 Diplomas, 81 Buttermaking and 46 Cheesemaking Certificates have been awarded.

Under the Medal Distribution Scheme the following Medals were awarded during 1927 :—

			Gold.	Silver.	Bronze.
Dairy Cattle	...	...	—	10	5
Produce	...	...	—	2	7
Buttermaking	...	...	—	5	2
Clean Milk Competitions	...	...	10	6	2
Dairy Herds Competitions	...	...	—	1	1
Milkers' Contests	...	...	—	2	2
			—	—	—
TOTALS	...	...	10	26	19
			—	—	—

The first year of the Inter-County Clean Milk Competition proved to be a great success. Eighteen Counties entered, of which eleven finally competed and over 400 dairy herds were included. The "Stapleton" Challenge Cup was awarded to Cornwall as the winning County, with Essex second and Berkshire third.

The question of admitting to future Dairy Shows only those cows which have passed the Tuberculin Test was again considered by the Council and it was decided that the time was not yet opportune to introduce this regulation.

The programme of the World's Dairy Congress, 1928, is now in its final stages of arrangement and promises to be of interest to all phases of the Dairy Industry. Meetings will be held in London, Reading and Edinburgh. The sections under which papers will be considered are as follows :—Milk Production, Milk Distribution and Manufacture ; Milk Consumption, Administration and Control ; Animal Physiology in Reference to Milk Production ; Veterinary Medicine in Reference to Dairy Cows ; Dairy Bacteriological Technique ; Dairy Chemical Technique. An exhibition of dairy machinery in connection with the Congress will be held at the Royal Show at Nottingham and exhibits will be shown from the United States, Germany, Holland and Denmark and from the chief manufacturers in this country. At the conclusion of the Congress tours will be arranged as follows :—

Tour A—Northern Ireland and the Free State—Nine days.

Tour B—Staffordshire, Shropshire, Cheshire and Lancashire—Five days.

Tour C—The S. W. Dairying District, starting from Bath—Five days.

Tour D—Southern Dairying District, starting from Bourne-mouth—Four days.

Tour E—S. E. Dairying District, starting from Eastbourne—Two days.

Members who may desire to take one or other of these tours are asked to give as early notice as possible. Those who propose to attend the Congress should apply for membership enclosing a cheque for one guinea at an early date in order that due notice of all meetings

and copies of all papers may be circulated to them well before the Congress opens. Such cheques or money orders should be made payable to the World's Dairy Congress, 1928, crossed The Midland Bank, Ltd., and sent to the Organising Secretary, World's Dairy Congress, 1928, 28, Russell Square, W.C. 1. This guinea admits to all sessions of the Congress and ensures a copy of its proceedings which will be published at its conclusion.

During the year 1927 the following Resolutions have been passed and forwarded to the bodies concerned :—

4th May.

“ This Association desires to express the opinion that the statement of the Free Importation of Canadian Cattle Association of Great Britain that 50 per cent. of British dairy cattle are tubercular is unjustifiable, inaccurate, unsupported by any evidence or authentic figures and merely a biased estimate calculated to mislead uninformed opinion.”

31st May.

“ This Council, in view of the heavy increase since the War in Excise and Customs Duties on Products coming under the head of ‘ Food, Drink and Tobacco,’ and also in view of the very large increase in Imports of Agricultural Products, much of which could be produced in this country, urge on the Government the question of revision of taxation, in order that without increased taxation, or increase in the general budget to the consumer, and without reduction in the National Revenue, the incidence of taxation may be changed to fall partly on Imports of Agricultural Products coming under the heading of ‘ Food, Drink and Tobacco,’ subject to foreign competition and capable of production in this country, rather than, as at present, on products not capable of production in this country, or if so capable of production in this country, not subject to foreign competition.”

19th October.

“ That breadstuffs imported into this country from abroad should come in the form of whole wheat rather than that of flour, so that the offals may be available as food for livestock and additional employment be provided for British labour, and that the exportation of milling offals be prohibited.”

By order of the Council,

FRED J. BULL,

Secretary.

The British Dairy

FINANCIAL

Dr.

GENERAL INCOME AND EXPENDITURE
WITH COMPARATIVE

EXPENDITURE.				1927.		1926.	
	£	s.	d.	£	s.	£	s.
Education and Examinations—							
Reading	188	9	2			205	4
Chelmsford	15	17	6			15	3
Studley	16	13	1			12	11
Somerset	12	11	8			12	16
				233	11	245	14
Journal				587	8	572	16
Medal Scheme				102	7	70	14
Bank Charges				17	15	30	9
Rent				240	0	240	0
Prizes to Exhibitors				2,365	16	3,524	8
Sales of Exhibits				1,205	1	1,461	11
Dairy Show—Hire of Hall, Fittings, Postage and Sundry Expenses				6,629	4	6,978	9
Catalogues				848	16	945	15
Salaries				861	3	1,072	18
Wages and Labour				1,403	2	1,689	2
Printing, Stationery, Postage, and Sundry Office Expenses				331	7	275	6
Re-decorating Offices				59	8	—	
Railway Fares for Attendance at Council Meetings				212	8	179	1
Auditors' Fees and Officers' Retaining Fees ...				148	1	129	13
Depreciation of Furniture and British Dairy Institute Plant				73	8	25	11
Income Tax, 1926-27				—		26	16
Donations—							
Royal Veterinary College	200	0	0			—	
International Dairy Congress	—					200	0
British Dairy Institute... ..	—					100	0
National Milk Publicity Council	—					50	0
Royal Agricultural Benevolent Institution	10	10	0			10	10
University of Reading Library	—					10	0
Central Chamber of Agriculture	5	0	0			5	0
National Pigeon Association	1	1	0			—	
				216	11	375	10
Corporation Duty				37	17	32	13
Stands at Agricultural Shows				40	0	40	0
Entry Fees returned on account of Foot and Mouth Disease				1,211	15	11	10
Conference Account				53	8	19	10
Inter-County Clean Milk Competition				116	10	—	
General Analyses				8	8	—	
BALANCE, being excess of Income over Expenditure				1,806	10	1,846	14
				£18,810	0	£19,794	7

Farmers' Association.**STATEMENTS.****ACCOUNT for the Year ended December 31st, 1927.****Cr.****STATEMENT FOR 1926.**

INCOME.						1927.			1926.		
						£	s.	d.	£	s.	d.
Subscriptions	...	...	...	...	...	1,564	18	6	1,396	7	3
Examinations—						£	s.	d.			
Reading	...	...	...	53	18	7			74	7	6
Chelmsford	...	...	...	15	17	6			15	3	0
Studley	...	...	...	16	13	1			12	11	8
Somerset	...	...	...	12	11	8			12	16	2
						99			114	18	4
Journal	...	...	...	...	...	122	15	6	115	11	7
Contributions to Prize Fund	...	...	...	...	...	67	12	6	374	4	0
Entry Fees, Competitive and Non-Competitive	...	...	...	...	...	9,962	12	2	9,348	16	9
Sales of Exhibits	...	...	...	...	...	1,340	9	0	1,654	11	9
Admission Money	...	...	...	...	...	3,561	10	6	4,355	18	5
Sales in Working Dairy	...	...	...	...	...	456	8	4	647	17	11
Catalogue Sales and Advertisements	...	...	...	...	...	935	1	8	1,140	16	5
Interest on Investments—											
Taxed before receipt	...	...	...	555	4	0			499	4	0
Untaxed before receipt	...	...	...	100	0	0			100	0	0
Bank Deposit	...	...	...	35	9	5			34	10	5
						690			633	14	5
Hire of Council Room	...	...	...	...	...	8	18	6	11	11	0
						£18,810			£19,794		
						0			7		
						11			10		

Dr.	STATEMENT OF ASSETS AND LIABILITIES, December 31st, 1927.			Cr.		
	£	s.	d.	£	s.	d.
LIABILITIES.						
Sundry Creditors	...	...	372 13 8			
Surplus of Assets over Liabilities at 31st December, 1926	...	...	...
Add Excess of Income over Expenditure, 1927	...	...	18,351 16 2			
ASSETS.						
Investments at Cost Price—						
£375 Southern Railway 4% Debenture Stock	265	0	0			
£375 London Midland & Scottish Rly. 4% Debenture Stock	280	0	0			
£500 India 3% Stock	265	0	0			
£2,000 War 5% Stock	1,701	9	0			
£1,500 L.C.C. 3% Stock	783	17	0			
£400 Hertfordshire 6% Stock	389	1	0			
£2,000 Metropolitan Water Board "B" 3% Stock	1,037	13	0			
£1,000 Victoria 5½% Stock	1,017	7	8			
£2,000 New South Wales 5% Stock	1,990	4	0			
£1,000 Tasmania 5% Stock	992	12	0			
£10,000 Conversion Loan 3½% ...	7,622	15	6			
						*16,344 19 2
Furniture and Appliances	...	...	516 6 11			
Less 10 % Depreciation	...	...	51 12 8			
British Dairy Institute : Value of Appliances at Reading	403	18	6			464 14 3
Less Depreciation	...	...	21 15 11			
						382 2 7
Sundry Debtors—General	...	...	12 11 8			
Dairy Show, 1927...	39	5	6			
"	...	...	...			51 17 2
Cash at Bank and in hand	...	...	...			1,480 16 8
						£18,724 9 10
*The value, according to Market Price, of these Investments at 31st December, 1927, was £17,324.						

REPORT OF THE AUDITORS TO THE MEMBERS OF THE BRITISH DAIRY FARMERS' ASSOCIATION.

We have audited the foregoing Statement of Assets and Liabilities and the Income and Expenditure Account with the books and accounts of the Association. We have received all the information and explanations we have required. In our opinion such Statement of Assets and Liabilities is a full and fair statement containing the particulars required by the Regulations of the Association, and properly drawn up so as to exhibit a true and correct view of the state of the Association's affairs according to the information and explanations we have received and as shown by the Books.

(Signed) HERBERT J. PAGE, *Chartered Accountant*,
 36, Walbrook,
 London, E.C. 4 } *Auditors.*
 PERCY T. HAY,
 H. E. HUGHES,
 W. E. MANCHESTER.

27th January, 1928.

British Dairy Farmers' Association.

MEDAL SCHEME.

Special Prizes at Educational Institutions and Country Shows.

The Council of the British Dairy Farmers' Association is prepared to consider applications from Educational Centres and Approved Societies in the United Kingdom for their Gold, Silver, and Bronze Medals to be awarded in connection with dairying and dairy farming under the following conditions, viz. :—

1. All applications must be made on our official form and must clearly state the object for which the Medal or Medals are required.
2. Only one application from any Institution or Society can be considered in any one year.
3. The application must be repeated annually if Medals are again required.
4. A copy of the Proposed Prize List, showing the Conditions of the Award of the Medal and the name of the judge, should accompany the application, and the offer of a Medal cannot be confirmed until the Prize List has been approved.
5. The British Dairy Farmers' Association stipulates that no entry fee shall be charged in respect of these Medals, they being offered as Special Extra Prizes.
6. Notification of the award, with the winner's full name and address, to be forwarded to the Secretary, British Dairy Farmers' Association, 28, Russell Square, London, W.C.1, within 14 days of the award being made.
7. A person may not receive more than one Medal under this Scheme for the same subject or exhibit during any one year.

STUDENTS.—The B.D.F.A. Silver Medal for Students is reserved for those who have obtained the B.D.F.A. Diploma.

The B.D.F.A. Bronze Medals may be awarded on application to Students gaining the first position in short course Examinations and the prospectus of the course must be forwarded with the application for the Medal.

DAIRY PRODUCE AND BUTTERMILK.—The B.D.F.A. will consider applications on behalf of County or similar Shows for a Silver Medal as a Championship award.

The B.D.F.A. Bronze Medals or Certificates may be available for local Shows, and in each case shall only be awarded to the best exhibit or competitor.

CATTLE.—The B.D.F.A. Silver Medals will only be awarded at County and similar Shows to cows or heifers' milk recorded under the Ministry of Agriculture Scheme.

The B.D.F.A. Silver Medals will only be awarded to Bulls out of recorded cows.

The B.D.F.A. Bronze Medals for cattle will be available only at Local Shows under similar conditions.

CLEAN MILK COMPETITIONS.—The B.D.F.A. Gold Medal may be available, on application, to the winner of clean milk competitions of six months or more duration. Silver Medals for clean milk competitions of shorter duration.

In the event of any dispute as to the interpretation of these Rules, the Council of the British Dairy Farmers' Association reserves full power of decision, and in the event of the Medal not being awarded in accordance with the above Rules and Conditions, the Council reserves the right to withhold the Medal altogether.

AWARDS DURING 1927.—Continued.

Applicant.	Show or Examination held at	Date.	Medal.	Winner and Object.
Bedfordshire Agricultural Society ...	Amphill	July 21 ...	Silver	A. Brittain, Shorthorn Cow, "Favourite 7th," as best Milk Recorded Dairy Cow.
Royal Lancashire Agricultural Society	Bolton	July 28—30—Aug. 1	Silver	T. Stuart, Shorthorn Cow, "Sowerby Ida 2nd," as best Milk Recorded Dairy Cow or Heifer.
University College of Wales	Wales	1st Dec., 1926—31st July, 1927	Gold	E. Davies, winner of Clean Milk Competition.
Buckinghamshire County Council ...	Bucks	1st March, 1927—31st July, 1927	Silver	Viscount Astor, winner of Clean Milk Competition (Championship Class).
"	"	"	Bronze	G. R. Holden, winner of Clean Milk Competition (other than Championship Class).
Bredon and District Agricultural Society	Tewkesbury	Aug. 1 ...	Bronze	Rev. P. F. Wigan, Shorthorn Cow, "Rose," as best Milk Recorded Dairy Cow or Heifer.
North-east Somerset Farmers' Club	Belton	Aug. 1 ...	Bronze	H. W. Paines, best exhibit of Cheese.
"	"	"	Bronze	Miss M. Patch, best exhibit of Butter.
Harrogate Agricultural Society ...	Harrogate	Aug. 5 ...	Bronze	Miss E. Robinson, best 2 rolls or squares of Butter.
Pearth Agricultural Society ...	Pearth	Aug. 9 ...	Bronze	J. Smith, Shorthorn Cow, "Sunflower," as best Milk Recorded Dairy Cow.
Penistone Agricultural Society ...	Penistone	Aug. 18 ...	Bronze	Mrs. J. Way, best exhibit of Butter.
Glannau Erch Agricultural Society	Pwllheli...	Aug. 19 ...	Bronze	Sir G. Meyrick, Bt., Welsh Black Bull, "Snowdon Bran," as best Dairy Bull out of a Milk Recorded Cow.
"	"	"	Bronze	Mrs. E. H. Spottiswoode, Welsh Black Cow, "Corwen Molly," as best Milk Recorded Dairy Cow or Heifer.
Dorchester Agricultural Society ...	Dorchester	Sept. 1 ...	Silver	R. N. Tory, Shorthorn Cow, "Anderson Lady 4th," as best Milk Recorded Dairy Cow.
"	"	"	Silver	R. N. Tory, Shorthorn Bull, "Anderson Lord Conjuror," as best Dairy Bull out of a Milk Recorded Cow.
East Devon Milk Recording Society	East Devon	1st Oct., 1926—30th Sept., 1927	Silver	Lord Portmore, Guernsey Cow, "July 4th des Omandes," as the Milk Recorded Cow giving highest yield of Butter Fat.
Lancashire Cheese and Dairy Show Association	Preston	Oct. 25 ...	Bronze	E. Sudell, best exhibit of Cheese.
Somerset and North Dorset Milk Recording Association	Somerset and North Dorset	Nov. ...	Silver	S. A. Rossiter, first place in Dairy Herds Competition.
Gloucestershire Root, Fruit, and Grain Society	Gloucester	Nov. 9 ...	Bronze	Huntinghorn Herd, second place in Dairy Herds Competition.
Kent Education Committee	Kent	1st Jan., 1927—1st Dec., 1927	Gold	Mrs. W. J. Brooke, best exhibit of Butter.
Oxfordshire Agricultural Committee	Oxfordshire	Dec., 1927	Silver	Viscountess Lewisham, winner of Clean Milk Competition.
"	"	"	Silver	W. Johnston, first place in Milksters' Contests for Competitors over 18 years.
"	"	"	Silver	Miss G. M. Borlace, first place in Milksters' Contests for Competitors under 18 years.
"	"	"	Bronze	H. Hopkins, second place in Milksters' Contests for Competitors over 18 years.
"	"	"	Bronze	L. Cherry, second place in Milksters' Contests for Competitors under 18 years.

British Dairy Farmers' Association.

PRIZE ESSAY ON A DAIRYING SUBJECT.

The Council offers a Prize of £10 and the B. D. F. A. Silver Medal for an Essay upon any practical or scientific subject relating to Dairy Farming or Dairying, conditionally upon sufficient merit being shown.

Preference will be given to one based on the original work and experience of the writer. Where the work of others is relied upon, full references must be given, either in footnotes or by numbers (1), (2), &c., with a list of authorities at the end.

The Essay should not exceed 5,000 words, and must be received by the undersigned on 1st December, 1928.

An Essay must be sent in a sealed envelope, bearing a *nom de plume*, and in another sealed small envelope, also bearing the *nom de plume*, the Author must insert his name and address.

The Prize Essay will be the property of the Association. Others will be returned to their respective Authors, but the Association reserves the right to retain Essays on subjects suitable for inclusion in the Annual Journal, which will be paid for at the usual rate for literary contributions.

FRED J. BULL,

Secretary,

28, Russell Square, London, W.C. 1.

THE British Dairy Farmers' Association

Suggestions to Farmers as to how best to ensure THE CLEANLINESS OF THE MILK SUPPLY.

The attainment of a clean milk supply is largely dependent upon the action of Dairy Farmers themselves.

Every Dairy Farmer is financially interested in this question. Public doubt of the cleanliness of the milk supply means reduced demand for fresh milk. Public confidence means increased use of milk as food and drink—consequently a larger demand.

Any Dairy Farmer by want of reasonable care can jeopardise the reputation of the whole industry and thus destroy the good work of those whose efforts are to increase the consumption of milk.

The co-operation of every producer is confidently requested.

The main points to be emphasized are :—

- (1) That consumers are entitled to receive milk which is clean and wholesome.
- (2) That the precautions necessary to produce clean wholesome milk are easy, simple and inexpensive.

Briefly these precautions are :—

- To keep the milk sheds and cows as clean as possible.
- To clean the udders and, before milking, wipe them with a clean damp cloth, rinsed after every cow.
- To use a partly covered milking pail.
- To see that milkers milk with clean hands.
- To strain the milk through a strainer fitted with a new disc of cotton wool at each milking.
- To empty water from cooler before washing.
- To rinse utensils in cold water. Thoroughly wash in hot water and soda and scald in boiling water or, preferably, sterilise with steam or by boiling in water.
- To stand utensils upside down to drain after cleaning and NOT to wipe them.

**THIS ASSOCIATION APPEALS TO EVERY DAIRY FARMER TO PUT
THESE PRECAUTIONS INTO OPERATION, BEING CONVINCED
THAT IF PRODUCERS DO NOT TAKE MEANS TO ENSURE A
CLEAN WHOLESOME MILK SUPPLY THE DEMAND FOR
FRESH MILK WILL SERIOUSLY DIMINISH.**

Correspondence on this subject will receive attention at the
Offices of the Association, 28, Russell Square, London, W.C. 1.

British Dairy Farmers' Association.

Examination for

THE B. D. F. A. DIPLOMA.

The Association grants to any Candidate who satisfactorily passes the necessary Examinations :—

A Diploma for Proficiency in the Science and Practice of Dairying.

Candidates for the Diploma must produce satisfactory evidence that they have attended a Dairy Diploma course of not less than two academic years at some recognised centre for Dairying instruction, and have spent at least six months on a recognised Dairy Farm, and have taken part in the work of the Farm; such practical work to be in addition to the time spent at the centre for Dairying Instruction.

The Examination will extend over three or more days, and will test the Candidates' knowledge and experience of the Principles and Practice of Dairying and Dairy Farming.

For these purposes papers will be set upon the following subjects :—

1. Dairy Farming and Dairy Hygiene.
2. *Dairying*, including (a) Principles of Dairying; (b) Dairy Factory Management and Dairy Engineering.
3. *Dairy Chemistry*, including (a) General Chemistry and Physics; (b) Dairy Chemistry.
4. Dairy Bacteriology.
5. Dairy Book-keeping.

The Candidates will also be required to satisfy the Examiners with regard to their skill in Butter and Cheesemaking.

Candidates will be required to answer, in writing, sets of questions within a given time, and will also be examined *viva voce*. They will be expected to possess a sound knowledge of all the subjects included in the following Syllabus. Candidates, if required, must produce their note-books of Lectures and Demonstrations attended.

The *Practical Examination* will include Buttermaking, and also the preparation of one Hard-pressed Cheese, either Cheddar, Cheshire or Derby, to be selected by the Examiner, and one Blue-veined Cheese, either Stilton or Wensleydale, to be selected by the Candidate.

The Diploma of the Association will be awarded to all Candidates who obtain not less than :—

- (a) 60 per cent. of the total possible marks for the Theoretical Examination, and
- (b) 75 per cent. in the Practical Examinations.

The Diploma with Honours will be awarded to Candidates satisfying the following conditions :—

- (1) The Candidate shall obtain not less than 65 per cent. of the possible marks for each and every written paper.
- (2) The Candidate shall obtain not less than 80 per cent. of the possible marks in each Practical Examination (Cheese and Buttermaking).

A silver medal will be awarded to the candidate who obtains the highest marks in the Diploma with Honours.

Examinations for the Diploma are held in the Autumn upon dates to be announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the commencement of the Examination.

The entry fee is 20s.

SYLLABUS OF SUBJECTS OF EXAMINATION.

1.—DAIRY FARMING AND DAIRY HYGIENE.

(a) Dairy Farming.

Dairy Cattle.—Characteristics of different breeds and choice of dairy cattle. The milk yields of the more important breeds, and suitability for the milk trade, cream, butter and cheese production.

Foods and Feeding.—Summer and winter feeding of dairy cattle. Root and fodder crops. Green forage. Ensilage. Different kinds of food and their relative composition. The effect of food upon milk, butter and cheese. Special foods used for dairy stock. Preparation of food for dairy stock. Feeding of calves and young stock.

Housing and Management.—The situation, chief dimensions and construction of cow houses; ventilation, drainage, water supply. Systems of herd management, including management of herd bulls and in-calf heifers. Cattle breeding and grading up of dairy stock. Systems of calf rearing. The housing and management of young stock.

Milk Recording.—Systems and utilization of results. Details of official schemes.

Milk Production.—Factors influencing the yield and quality of milk. Milking by hand and machine. Location and equipment of farm dairies. The production and sale of clean milk. The treatment of milk from the cow to the milk factory or consumer.

Management of Pigs.—Characteristics of the more important breeds. Feeding of pigs. The management of sows and breeding stock. Farrowing, weaning, rearing and fattening of pigs. Systems of pig keeping, including outdoor management. The production of pork and bacon.

Soil and Cultivation.—Types of soils suitable for dairying. Fertility in soils. Soil cultivation. Manures and manuring of arable and grass land.

Plant Physiology.—Fruits and seeds of agricultural plants. Roots and shoots. Flower construction and seed formation. Experiments to demonstrate the fundamental facts of plant physiology.

Crop Management.—Rotations and systems of cropping. Cultivation, manuring and management of roots, forage and other crops used in dairying. Silage crops. Temporary and permanent pasture. Haymaking.

Farm Management.—Systems of dairy farming. The selection, stocking and equipment of typical farms. The organization of the farm and disposal of produce. Cost of milk production.

Dairy Economics.—The dairy industry of Great Britain and its relationship to Agriculture. The relative importance of the various products. The retail milk trade. Markets. Dairy organization and co-operation. Modern developments in the dairy industry. American, Colonial and Continental dairying.

(b) Dairy Hygiene.

Animal Physiology.—General functions of the organs of the animal body. Breeding. Parturition. The structure of the udder and the process of milk secretion. Changes which food undergoes during digestion.

Veterinary Hygiene.—The more important diseases of dairy cattle and their remedies. The transmission and eradication of disease.

Milk Hygiene.—Sanitary conditions. Air space and ventilation. Suitability of water supply, temperature, &c. Methods of milking and handling of milk. Transportation. Prevention of contamination. Pasteurization. Sterilization. Legislation affecting milk production. Milk in relation to public health.

2.—DAIRYING.

(a) Principles of Dairying.

Milk.—Condition on delivery. Use of utensils and appliances. Cooling of milk. Importance of cleanliness. Keeping of milk. Legal standards. Methods of utilization of milk and their comparative returns. Pasteurization of milk.

Milk Testing and Sampling.—The use of the Gerber and Babcock fat testers. Lactometer readings. Scale readings. Sample of milk for testing. Interpretation of results.

Cream.—Separators and their management. Different systems of cream raising and ripening of cream. Changes during ripening. Natural and artificial ripening and preparation and uses of starters. Preparation of cream for sale. Use of preservatives. Clotted cream.

Butter.—Churns and buttermaking appliances. Preparation of cream for churning. Washing and working butter. Butter milk. Packing and transmission of butter. Selection and keeping of butter. Salting. Use of preservatives. Characteristics of good butter and method of judging. Circumstances affecting the flavour, texture, colour and keeping qualities of butter. Potting butter for keeping. Causes of inferior butter. Conditions which affect the butter yield.

Cheese.—Properties of milk suitable for Cheesemaking. Principals of manufacture. Appliances for cheesemaking. The making of the principal varieties of British, Colonial and Continental cheese from cream, whole milk and skim milk. Acidity of milk. Common tests for acidity. Use of rennet and its substitutes. Whey. Ripening and storage of cheese. Packing and sale of cheese. Making of cream and other soft cheese. Defects in cheese and their causes. Judging cheese. Composition of cheese.

Dairy By-Products.—Composition, uses and value of skim milk, butter-milk and whey.

Records, Keeping of.

(b) Dairy Factory Management and Dairy Engineering.

Factory Practice.—Milk depôts and handling of factory milk. Systems of cooling and refrigeration. Pasteurization. Factory butter and cheese making. Milk powders. Condensed milk. Frozen milk. Ice cream. Dried casein. Fermented milk. Lactose and whey-butter. Margarine manufacture. Equipment of milk depôts, butter, cheese and dairy factories.

Factory Management.—Factory routine. Organization of labour. Handling of milk on arrival at the factory. Methods of dealing with the milk. Milk contracts. Dairy factory legislation.

Production of Power.—The various forms of energy as used for the production of power.

Machinery.—Care and management of engines and boilers. Power transmission. Construction and use of dairy factory machinery. Refrigerating machinery.

Dairy Appliances.—Appliances used in the production and handling of milk, butter and cheese making. Milk testing apparatus.

Buildings.—Situation, construction and drainage of creameries, milk dépôts and dairy factories.

3.—DAIRY CHEMISTRY.

(a) General Chemistry and Physics.

General Principles of Chemistry.—The nature of elements and compound bodies. The different forms of matter, solid, liquid, gaseous. Specific gravity and instruments for determining it. Specific heat. Temperature and methods of measuring it. Thermometric scales. The influence of temperature in dairy operations. Physical and chemical changes involved in the following: Solution, precipitation, filtration, distillation, oxidation and reduction. Acids: Bases; Salts: their distinctive properties and quantitative estimation. Examination and identification of specimens and apparatus.

The Atmosphere.—Its constituents and impurities; its influence on dairy operations. Atmospheric pressure.

Water.—Constituents of pure and natural waters. The impurities of water and whence derived. The importance of a pure water supply in dairying.

Inorganic and Organic Chemistry.—General knowledge of the elementary chemistry of the following substances and their compounds so far as met with in dairying: Potash, soda, ammonia, lime, phosphoric acid, alcohol, acetic acid, carbonic acid, butyric acid, lactic acid, albumen, casein, fats, milk-sugar, glycerine, pepsin, saponification of fats.

(b) Dairy Chemistry.

Chemistry of Milk.—The nature, composition, properties and chemical constituents of milk. Microscopical appearances presented by milk. The influence of feeding. The changes which occur in the keeping of milk, and how produced. The natural and artificial souring of milk. Rennet, its nature and use.

Milk Products.—Physical and chemical changes involved in the making and keeping of butter and in the manufacture and ripening of cheese. Separated milk. Condensed milk. Fermented milk. Synthetic milk. The use of preservatives.

Dairy Analysis.—Analytical methods, their theory and practices. A general knowledge of the methods employed in the chemical analysis of milk, butter, and cheese. Adulteration of milk, cream, butter, and cheese, the ways in which adulteration is practised, the changes in composition thereby produced, and a general knowledge of the methods employed in detecting the same.

Chemistry of Feeding.—The principal constituents of food materials and the functions they severally fulfil. The influence of food constituents on milk production. Assimilation and digestion. The manurial value of foods. Milk and milk products as foods.

4.—DAIRY BACTERIOLOGY.

General Bacteriology.—Bacteria; their form, classification, growth and reproduction. The microscope and its use. Staining and microscopic examination of bacteria. Methods of isolation and cultivation. Preparation of culture media. Fermentations and chemical changes produced by bacteria. Enzymes and their action. Effects of heat, cold, sterilization, pasteurization, disinfectants and preservatives on bacteria and enzymes. Bacteriological examination of water supplies.

Bacteriology of Milk.—The changes produced by bacteria in milk. Useful forms and their functions. Harmful forms and their effects. Coagulation, discolouration, taints, &c. Bacteriological and other standards in relation to the cleanliness of milk.

Milk Products.—The bacteria concerned in the ripening of cream for butter making. "Starters": their preparation and management. The ripening of hard, soft, and blue-veined cheese. Bacteria injurious to milk products, including condensed and dried milk.

Dairy Mycology.—Moulds and yeasts in dairy practice. Their form, classification, growth and relation to dairy products.

5.—BOOK-KEEPING.

General Principles.—Principles of double entry book-keeping. Use of diary, journal, cash book and ledger. Posting to ledger. Preparation of profit and loss account and balance sheet. Systems of valuation.

Farm Book-keeping.—Application of the principles of book-keeping to dairy farming and to the sale of milk in bulk or by retail. Milk ledgers and customers' accounts.

Factory Accounts.—Methods of book-keeping as applied to milk depôts and dairy factories.

Business Management.—General office work. Banking and use of cheques.

CERTIFICATE IN DAIRY FACTORY MANAGEMENT.

Candidates for the Certificate in Dairy Factory Management must fulfil the following conditions :—

1. They must possess an approved Diploma in Dairying.
2. They must have had six months' practical instruction at an approved dairy factory, or at an approved dairy factory school.
3. They must obtain 60 per cent. of the possible marks in the examination for the Certificate in Dairy Factory Management.

Examination for the.

CERTIFICATE IN DAIRY FACTORY MANAGEMENT.

1. Two papers will be set on the subjects outlined in the following syllabus.
2. Candidates will be examined orally in Factory Management with reference to the type of factory in which their practical training has been obtained.
3. Candidates must submit to the Examiners full notes of the work which has been carried out in the factories in which their practical experience has been obtained.

SYLLABUS OF EXAMINATION.

This Syllabus should not be viewed from a purely engineering standpoint, but students will be expected to have a general knowledge of the management of factory machinery :—

Paper 1.—Planning, Equipment and Management of a Dairy Factory.

Dairy Factories.—Site, building materials, construction, laying of floors, lighting, ventilation, drainage, sanitation, disposal and treatment of sewage and factory waste. Space requirements for the common types and sizes of factories.

Water Supply.—Water requirements ; sources of supply. Examination for quality and purity. Methods of purification. Suitability of water supplies for dairy purposes. Sites for wells. Construction of wells. Artesian wells. Pumps for deep and shallow wells. Air-lift pumps.

Factory Equipment.—Artificial lighting and sources of power in the factory. Equipment required for various types of factories and approximate cost of same. The disposition and control of factory machinery.

Steam Plant.—Types of vertical and horizontal boilers and their relative advantages and disadvantages. Sizes of boilers required in dairy factories. Evaporating power of boilers. Setting and insulation. Cleaning out of boilers. Economical firing. Fuel used, *e.g.*, coal, coke and wood. Cost and calorific value. Fuel consumption and cost of steam production. Allocation of steam supply to different purposes in the factory. Boiler smoke stacks and their construction. Boiler fittings, including donkey pumps and water injectors. Feed heaters. Methods of economising steam supply.

Factory Machinery.—Steam, gas and oil engines. Electric motors, turbines, water power, comparison of the various types and their relative efficiency. Construction and working of the various types. Cost of maintenance. Power requirements of the factory and the most suitable combinations of power when different sources of energy are available. The management and fitting up of machinery, including electric fittings. Adjustment of bearings. Packing of glands. Fixing of brackets, &c. Lubrication of machinery. Oil containers and filters. Lubricants. Lubrication of high-speed machinery. Oils and grease for shafting. Arrangement of machinery and methods of transmitting power. Belts, types and uses. Repairs to belting. Pulleys and gearing. Methods of increasing and reducing speed. Labour-saving devices. Tools required for a dairy factory.

Factory Plants.—Construction and operation of milk apparatus, including clarifiers, pasteurisers, separators, milk pumps, refrigerators, &c. Refrigerating machinery, CO₂ and ammonia. Methods of operation and management. Cold storage and brine cooling. Efficiency in the transfer of heat in heating and cooling apparatus. Methods of carrying out efficiency tests under different conditions and outputs. Factory appliances including cheese vats, holding vats, power churns, bottling machinery and other factory equipment. Their approximate cost and suitability of the various types. Methods of cleaning equipment, utensils and milk churns.

Factory Management.—Organization of labour. Business management. Book-keeping. Cost accounts. Profit and loss in manufacturing. Stock-taking and depreciation. Railway rates and conditions. Road transport. Systems and comparative costs. Advertising. Markets and sale of produce. Co-operative organization.

Factory Law.—Law as far as it affects the factory, the management and the produce. Factory and Workshops Act. Workmen's Compensation. Health Insurance. Employer's Liability and Trade Boards Acts. Industrial and Provident Societies Act. Rivers

Pollution Act. Sale of Foods and Drugs Act. Milk and Dairies Acts and other legislation as it affects the working of factories and the manufacture and sale of dairy produce.

Paper 2.—Handling and Utilization of Milk and Milk Products.

Handling of Milk.—Purchase, collection and distribution of milk. Management of milk on arrival at the factory. Weighing, sampling, testing, recording and cleaning. Methods of paying for milk and cream.

Utilization of Milk.—Methods of dealing with milk for sale for cream production, butter making, cheese making, and for the manufacture of other products.

Factory Products.—Preparation of cream for market. The manufacture and treatment of butter and cheese. Manufacture of condensed and powdered milk, casein and milk sugar, &c. Ice cream manufacture, &c. The utilization of by-products.

Pig-Keeping.—Feeding and management of pigs. The production of pork and bacon. Bacon curing.

The Entry Fee for each Candidate is £4 4s.

Examination for **CHEESEMAKING CERTIFICATE.**

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking.

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Cheese-making. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. On the same or following day a Practical Examination in Cheesemaking will take place.

Candidates will be considered to have passed the Examination if they obtain not less than 60 per cent. of the marks on each and every written paper and not less than 66 per cent. in the Practical test.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least twelve months' instruction in the Theory and Practice of Cheesemaking, of which at least six months must have been spent at a recognised centre for dairy instruction. They must possess a sound knowledge of the subjects included in the following Syllabus.

Candidates will be required to make one Hard-pressed Cheese, either Cheddar, Cheshire or Derby, to be selected by the Examiner, and one Blue-veined Cheese, either Stilton or Wensleydale, to be selected by the Candidate. They must also have a knowledge of the manufacture of other varieties of Hard-pressed Cheese and of Soft Cheese.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Examinations for Cheesemaking Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 10s.

SYLLABUS.

1. Milk.—The Food Value of Milk ; The Yield of Milk from various Breeds ; Secretion of Milk and Structure of the Udder ; Milking by Hand and Machine ; Handling of Milk from Cow to Dairy ; Importance of Cleanliness ; Production of Highest Grade Milk ; Cooling of Milk ; Sale of Milk ; Influence of Food on the Yield, Flavour and Fat Contents of Milk ; Composition of Milk, Nature and Properties of its Constituents ; Differences between Morning and Evening Milk and their Causes ; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers ; Testing for Acidity ; Causes of Fermentation ; Colostrum, its nature and properties ; the Keeping of Dairy Records ; the Handling of Evening's Milk for Cheesemaking ; Properties of Milk suitable for Cheesemaking ; Taints in Milk, their Causes, Effects and Remedies ; Tests for such Taints ; the Ripening of Milk for Cheesemaking ; Methods and Reasons for Ripening ; use of Natural and " Culture " Starters ; Pasteurization of Milk ; Chilled Milk ; their subsequent use for Cheesemaking ; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy ; Utilization of Dairy By-products.
2. Cheese.—Rennet : its Preparation, Properties, and Action upon Milk ; Testing its Strength ; Storage of Rennet ; Substitutes for Rennet ; Annatto ; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses, including the use of wood and metal tubs and jacketed vats ; Methods of Scalding ; the Development and Control of Acidity in Curd ; Salting and Brining in Cheesemaking ; Bandaging ; Ripening and Storing of Hard-pressed, Blue-veined and Soft Cheeses ; Defects in Cheese and their causes ; Composition of Cheese ; Composition and Utilization of Whey ; the Manufacture of Whey Butter ; the Equipment of a Cheese Dairy and its Cost ; the care of Utensils ; the Detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese :—
 - (a) A Hard-pressed British Cheese (not less than 25 lbs. weight).
 - (b) A Blue-veined British Cheese (not less than 10 lbs. weight).

Examination for
BUTTERMAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

**A Certificate of Merit for Proficiency in the Theory and Practice of
Buttermaking.**

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Buttermaking. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. On the same or following day a Practical Examination in Buttermaking will take place.

Candidates will be considered to have passed the Examination if they obtain not less than 60 per cent. on each and every written paper, and not less than 66 per cent. in the Practical Test.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least three months' instruction (not necessarily at a Dairy School) in the Theory and Practice of Buttermaking. They must possess a sound knowledge of the subjects included in the following Syllabus. They will be required to make Butter.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Examinations for Buttermaking Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 5s.

SYLLABUS.

1. Milk.—The Food Value of Milk; the Yield of Milk from various Breeds; Secretion of Milk and Structure of the Udder; Milking by Hand and Machine; Handling of Milk from cow to dairy; Importance of Cleanliness; Production of Highest Grade Milk; Cooling of Milk; Sale of Milk; Influence of Foods on the Yield, Flavour and Fat Contents of Milk; Composition of Milk, Nature and Properties of its constituents; Differences between Morning and Evening Milk and their causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its nature and properties; the Keeping of Dairy Records.
2. Cream.—The Various Methods of Obtaining Cream; the Construction and Use of the Utensils employed; Separators, the Construction and Use of the various Types; Composition of Cream, Separated Milk, Skimmed Milk, and Buttermilk, with Simple Tests for Fat in same; the Ripening of Cream—Objects and Results; Changes during Ripening; Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.
3. Butter.—The Various Methods of Obtaining Butter, including the Churning of Whole Milk; Utensils required, and the Preparation, Use, and Care of same; the Process of Butter Manufacture in all its details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour, and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.

Particulars and Entry Forms for all Examinations may be obtained from

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C. 1.

EXAMINATIONS AT LOCAL CENTRES.

In order to meet the convenience of Students at Dairy Schools, members of local Societies, and other persons, the Association will conduct Examinations for its Diplomas and Certificates at any place in the United Kingdom upon receiving satisfactory proof that the following conditions will be observed :—

That the School, Society, County Council, or other body requesting such an Examination to be held, undertake :—

- (1) To supply all necessary appliances and materials.
 - (2) To pay the fees and expenses of the Examiners.
 - (3) To supply the milk required free from preservatives and fit for Cheesemaking.
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Copies of Question Papers set at recent Examinations may be obtained at 3d. per copy.

Applicants are requested to state whether Diploma, Cheese, or Butter questions are required.

Further particulars and Entry Forms for Students may be obtained from

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.1

EXAMINATION RESULTS, 1927.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE SOMERSET FARM INSTITUTE, CANNINGTON; ON MONDAY, TUESDAY, AND WEDNESDAY, MARCH 28th, 29th, and 30th.

A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Isabel H. Cox, Mary E. Cox, Harriet A. Crago, Leslie E. G. K. Elliott, Florence J. Hayball, Calantha Pearce, Ida Tyley, and Ivy A. Ware.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Isabel H. Cox, Mary E. Cox, Florence J. Hayball, and Ralph Hoddinott.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING; ON TUESDAY, WEDNESDAY, THURSDAY, AND FRIDAY, JUNE 7th, 8th, 9th, and 10th.

A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Lilian Abbotts, William G. Alexander, Beth C. Beamond, Betty V. Black, Geoffrey S. Briggs, John P. Byrne, Albert C. Castle, Eimer J. Coles, Marjorie Fleet, Edwina J. Galmiche, Helen F. Gilchrist, Ethel G. Hannam, Barbara L. Harrison, Margaret L. Hopson, James E. Howes, Owena Jenkins, Margaret M. Jones, Edith M. Lloyd, Margaret Mitchell, Phyllis M. Packman, Elizabeth G. Pritchard, Gladys E. Roberts, Margaret E. Sandercock, Elinor Simon, Mary Stephen, Angela A. Stocker, and Nora M. Tame.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to William G. Alexander, Geoffrey S. Briggs, Ellen G. Butler, Albert C. Castle, Hilda M. Hatchwell, James E. Howes, Owena Jenkins, Margaret M. Jones, Ralph Keen, Doris S. Lindsay, Mabel G. Longhurst, Phyllis M. Packman, Elizabeth G. Pritchard, and Sylvia L. Udell.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE EAST ANGLIAN INSTITUTE, CHELMSFORD; ON FRIDAY, MONDAY, AND TUESDAY, JULY 1st, 4th, and 5th.

A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Percy E. Campen, Cecil J. Everitt, Walter Fish, Arthur Grove, Edwin H. Hinton, Phyllis E. W. Lyndridge, Kathleen Martin, Mary P. M. Parrott, Gordon K. Read, Ralph N. Sadler, Edith Saunders, John N. Sharrock, Joan Simpson, Florence A. Smith, Pansy M. Smith, and Roland J. Windley.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Cecil J. Everitt, Arthur Grove, Edwin H. Hinton, Phyllis E. W. Lyndridge, Mary P. M. Parrott, Ralph N. Sadler, John N. Sharrock, Joan Simpson, Florence A. Smith, and Pansy M. Smith.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT STUDLEY COLLEGE, STUDLEY; ON MONDAY AND TUESDAY, JULY 11th and 12th.

A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Violet F. Bosanquet, Marjory P. Lawrence, Susan J. Mayfield, Dorothy W. Mills, Mavis Moir, Phyllis A. Moir, Theodora Morris, Rosalys C. Skene, Agnes K. Swayne, Elizabeth F. Turtle, and Joan M. Turtle.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Irene D. Beston, Norah M. Fisher, Edith E. Fosbery, Ruth Gilleat, Dorothy W. Mills, Evelyn M. Mosley, and Jocelyn B. B. Robertshaw.

EXAMINATION FOR DIPLOMA, BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY, THURSDAY, AND FRIDAY, SEPTEMBER 12th, 13th, 14th, 15th, and 16th.

A Diploma for Proficiency in the Science and Practice of Dairying to Geoffrey S. Briggs, Dorothy A. Brunning, Ellen G. Butler, Nancy C. Butchart, Albert C. Castle, Mary L. Evelyn, Leslie F. Gregory, Hilda M. Hatchwell, Annetta M. Heaton, William A. Jones, Doris S. Lindsay, Mabel G. Longhurst, Anthony J. Marval, Evan G. Owen, Elizabeth G. Pritchard, Francis J. Robinson, Ralph N. Sadler, John N. Sharrock, Michael H. Summers, and Sylvia L. Udell.

A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Gramina B. Brine, Margaret I. Denyer, Eileen V. Ellaway, Grace D. Farnfield, Herbert G. Fowler, Muriel E. Gabell, Elfreda N. Heard, John P. Heaver, Madge Hildage, Ada D. Knight, Mildred P. Knowles, John H. Norris, George R. Parker, Jack L. Robins, Margery H. Sargent, Lewis B. Secrett, Norah P. Slattery, Daphne Steven, and Lilian V. Williams.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Herbert G. Fowler, Muriel E. Gabell, Ethel G. Hannam, Ada D. Knight, Mildred P. Knowles, John H. Norris, Margaret E. Sandercock, Lewis B. Secrett, Daphne Steven, Nora M. Tame, and Lilian V. Williams.

EXAMINATION FOR BUTTERMILKING CERTIFICATE AT
SOMERSET FARM INSTITUTE, CANNINGTON, MONDAY,
TUESDAY, AND WEDNESDAY, MARCH 28TH, 29TH, AND
30TH, 1927.

EXAMINER :

ALEC TODD.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Is the food which is given to the cow in any way responsible for the flavour and richness of the milk ?
2. How would you treat the milk on a small farm where buttermaking is done twice weekly ?
3. State briefly and compare the returns you would get from 20 gallons of whole milk : (1) Making Devonshire cream ; (2) Selling whole milk ; (3) Making butter.
4. What do you consider are the essential points of a good butter ?
5. How would you test a sample of milk for fat and solids not fat ?
6. What is the composition of cream ? How would it vary for butter-making and cream cheesemaking ?
7. Describe a centrifugal cream separator with which you are familiar, and explain its action.
8. Compare the reliability of results obtained by testing new milk by :—
 - (a) Lactometer.
 - (b) Creamometer.
 - (c) Centrifugal method.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT
SOMERSET FARM INSTITUTE, CANNINGTON, MONDAY,
TUESDAY, AND WEDNESDAY, MARCH 28TH, 29TH, AND
30TH, 1927.

EXAMINER :

ALEC TODD.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates will subsequently be examined *vice versa*.

QUESTIONS.

1. Why is good clean pure milk so essential to the making of first-class cheese ?
2. How would you best clean dairy utensils, especially milking buckets and cheese cloths ?
3. What part do bacteria and enzymes play in cheesemaking ?
4. In the month of June you are given a vat containing 50 gallons of milk for Cheddar cheesemaking. How much curd whey and ripe cheese would you expect to get from this ? State roughly the composition of the curd, whey and cheese.
5. Why does a Wensleydale cheese develop a blue mould. What is the fault when they do not go blue ?
6. Describe how you would treat a Cheddar cheese from the time it is put to press till it is placed in the curing room.
7. Why is it necessary to alter the proportion of rennet and salt at different periods of the cheesemaking season ?
8. How would the appearance of the cheeses in a curing room give you an indication to good or bad manufacture.

EXAMINATION FOR BUTTERMILKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON TUESDAY,
WEDNESDAY, THURSDAY AND FRIDAY, JUNE 7TH,
8TH, 9TH AND 10TH, 1927.

EXAMINER :

R. H. EVANS, B.Sc.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Explain why milk is sometimes described as a "perfect food."
2. Compare and contrast the milk obtained from a herd of Ayrshire and a herd of Jersey cows respectively.
3. Under what conditions do you find the greatest and least difference in composition between the morning and evening milk yielded by a herd of cows?
4. Describe the uses of the
 - (a) Lactometer.
 - (b) Creamometer,and explain how far you can depend upon the results obtained in each case.
5. Where the "deep-setting" system of obtaining cream is resorted to, it is found that the rate at which the cream rises to the surface of the milk varies. Explain why this is so.
6. What is the normal loss of fat during the process of buttermaking? Where the loss exceeds this figure, discuss the causes which may account for it.
7. Give the chemical composition of
 - (a) A good sample of butter.
 - (b) An inferior sample.Under what circumstances may (b) be considered a better sample than (a).
8. In order to obtain the best possible results, explain at which stages during the process of churning special care and skill are necessary.
9. "Ordinary farm butter cannot always be depended upon." Discuss the above statement.
10. Define the terms—Specific gravity: density: solids other than fat: acidity.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON TUESDAY,
WEDNESDAY, THURSDAY AND FRIDAY, JUNE 7TH,
8TH, 9TH AND 10TH, 1927.

EXAMINER :

C. W. WALKER-TISDALE.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Why is it considered important that the milk supply for cheese-making should be clean and free from contamination?
2. What faults would you expect to find in cheese made from tainted milk. What steps would you take to counteract these faults?
3. What is a starter and what are the advantages of using it in cheesemaking?
4. Describe the action of rennet. What conditions are likely to hasten or to retard its action on milk?
5. State the composition of Cheddar Cheese. How does the quality of the milk used affect the yield of cheese?
6. What happens in the ripening of Cheddar Cheese? State the average loss of weight in the ripening room.
7. In what way would you vary the process in making Cheddar Cheese from pasteurised milk?
8. If milk shows .3 per cent. of acid, how would you treat it so as to produce good marketable cheese.
9. State how pasteurised or crustless cheese is made. Could this be successfully made at a farm dairy?
10. Compare the returns from 100-gallons of milk containing 3.8 per cent. used for

(a) Cheddar Cheesemaking.

(b) Cream Selling.

(c) Buttermaking.

(d) Sold Wholesale.

In your calculations use current market prices.

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT
THE EAST ANGLIAN INSTITUTE, CHELMSFORD;
ON FRIDAY, MONDAY AND TUESDAY, JULY 1ST, 4TH
AND 5TH, 1927.

EXAMINER : Mrs. REEVES.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Give the composition of a good sample of milk, and describe its most important properties.
2. How would you extract cream for butter making? Give the composition of a good sample for:—
 - (a) Butter making;
 - (b) Fresh cream trade.
3. What return would you get from 100 gallons of milk converted into:—
 - (a) Butter;
 - (b) Raw cream;
 - (c) Devonshire cream?
4. State the essential factors that have to be controlled during the preparation of cream for butter and cream-cheese making.
5. On what lines would you consider butter should be judged?
 - (a) In the case of fresh butter;
 - (b) In the case of potted butter.
6. Describe methods of testing milk for:—
 - (a) Milk selling;
 - (b) Butter making.
7. State causes which affect flavour, texture and colour of butter.
8. Give the source of taints often found in milk, and mention how they can be avoided.
9. Describe, with diagrams, the udder of a healthy cow, and briefly describe the secretion of milk.
10. Illustrate a milk-recording sheet (for one week), using the following breeds:—
Jersey, Friesian, Shorthorn, Ayrshire.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT
THE EAST ANGLIAN INSTITUTE, CHELMSFORD;
ON FRIDAY, MONDAY AND TUESDAY, JULY 1ST, 4TH
AND 5TH, 1927.

EXAMINER : MRS. REEVES.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Give a list of the breeds of Dairy Cattle with which you are acquainted, and describe the one you would keep for cheese-making purposes.
2. How would you deal with milk from the time of milking until it is renneted for the making of a Cheddar Cheese?
3. What are the influences of food on the yield and flavour of your cheese product?
4. Is a "starter" any advantage to dairy products? Describe how you would use it.
5. Give two methods of testing acidity during cheese-making. Which do you prefer?
6. What is
 - (a) Rennet? Describe its action on milk during the making of a cheese;
 - (b) Annatto? What advantage is obtained by its use?
7. Name the necessary equipment for a cheese dairy and its probable cost.
8. Describe the manufacture of a blue-veined cheese.
9. Give, approximately, the weight of cheese you would expect to get from 60 gallons of milk, when made into :—
 - (a) Cheddar Cheese.
 - (b) Derby Cheese.
10. Describe the result of curd vatted with insufficient acidity.

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT THE
STUDLEY COLLEGE, WARWICKSHIRE; ON MONDAY,
AND TUESDAY, JULY 11TH AND 12TH, 1927.

EXAMINER :

MISS A. MATTHEWS.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. State the reasons for any difference between the evening's and morning's milk.
2. What percentage of Butter Fat would you expect to find in separated milk and butter milk, and give reasons for an excess in each class of milk?
3. Describe the treatment of Cream on a Farm where butter is made twice a week.
4. Give reasons for badly washed Butter not keeping well.
5. Give the various names of the grades of Milk Licenced by the Minister of Health, stating briefly the regulations for production of any one grade.
6. Describe the Gerber test for finding the percentage of Butter Fat in Milk.
7. Describe the process of separation of Cream from Milk.
8. Why is the Lactometer unreliable in detecting the adulteration of Milk?
9. What are the constituents of Milk, and in what state are they present?
10. What are the reasons for rancid or bitter flavour in badly made Butter?

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
STUDLEY COLLEGE, WARWICKSHIRE; ON MONDAY
AND TUESDAY, JULY 11TH AND 12TH, 1927.

EXAMINER :

MISS A. MATTHEWS.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Explain the vital stages in the manufacture of the following varieties of Cheese :—Wensleydale, Cheshire and Cream Cheese.
2. What are the main causes of loss of Butter Fat (a) in the whey, (b) in the ripening cheese ?
3. Compare the manufacture of Cheddar and Caerphilly Cheese.
4. What is the chief cause of Stilton Cheese going blue ?
5. What is the cause of (a) Cheese heaving, (b) Running whey in the ripening room ?
6. Name the various tests used in cheesemaking and state which you prefer.
7. What would be the result of (a) adding Rennet when Milk was too sweet, (b) adding too little Rennet to Milk, (c) adding too much Rennet, and what steps would you take to remedy either of these mistakes ?
8. State the correct temperature for the Cheese Ripening Room and what would be the result of (a) too high temperature, (b) too low, (c) badly ventilated ?
9. A great deal of trouble has been caused with tainted Milk in a Cheese Factory, state what steps you would take to discover the sender of the tainted Milk.
10. What are the chief points to be observed when planning a curing room for Cheese ?

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE, READING; ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 12TH, 13TH,
14TH AND 15TH, 1927.

EXAMINER :

R. H. EVANS, B.Sc.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

DAIRY FARMING AND DAIRY HYGIENE QUESTIONS.

(Only nine questions to be answered.)

1. What proportion of a 200 acre dairy farm, 80 acres of which is arable land, would you put under roots? How would you treat a piece of foul wheat stubble in preparation for the crop?
2. What crops, in addition to the root crop, would you grow in order to provide succulent food for your milch cows during the winter and early spring? Give in each case the time of sowing; the amount of seed you would sow per acre; the time the crop would be ready to feed; and the probable yield per acre.
3. Describe laboratory experiments by which it can be shown that plants give off (a) water; (b) carbon dioxide gas.
4. In what forms is lime usually applied to land? What conditions would you take into consideration, in deciding which form you would apply in any particular case?
5. What breed of pigs—and how many—would you keep on the farm mentioned in Question 1? Give reasons for your answer.
6. Briefly compare and contrast British and Continental dairying.
7. What place should poultry take on the farm referred to in Question 1. What number of birds should be kept and what would the probable gross returns be?
8. Briefly describe the process of digestion in the case of a cow. What ailments are cows subject to, as the result of impaired digestion?
9. Describe any up-to-date system of ventilation for cow-byres.
10. State briefly the Ministry of Health's regulations as to the conveyance and distribution of milk, in accordance with the provisions of the Milk and Dairies Order, 1926.
11. Enumerate the more important characteristics of a water which would be suitable for general dairy purposes.

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER 12TH, 13TH, 14TH AND 15TH, 1927.

EXAMINER :

C. W. WALKER-TISDALE.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and answers to Questions 1 to 6 should be fastened together in order in the left-hand corner. Answers to Questions 7 to 11 should be treated in the same way. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

DAIRYING QUESTIONS.

(Nine questions to be answered.)

1. Compare the quality of milk yielded by :—

(a) Shorthorns.	(d) Jerseys.
(b) Ayrshires.	(e) Guernseys.
(c) British Friesians.	
2. Enumerate in tabular form the essential conditions for the production of milk for market so that it will remain sweet for the greatest length of time.
3. State all the factors which influence the composition of milk.
4. What are the causes of bad flavours in milk?
5. A sample of milk contains 2.6 per cent. fat and 8.1 per cent. of solids-not-fat. How would you calculate the amount of added water in it?
6. State the principles of Cream Separation. Contrast three of the chief makes of machine in use.
7. If you are producing cream for the wholesale market—
 - (a) State what percentage of fat you would have in the cream and the number of gallons of milk it would take to produce one gallon of cream.
 - (b) How would you ensure that the cream possesses good keeping properties?
8. Explain the term "butter ratio" and give the butter ratio you would expect for the following breeds :—Shorthorn, Ayrshire, British Friesian, Jersey and Guernsey.
9. Enumerate the chief points of first-class butter.
10. State the quality, acidity, temperature, &c., of cream required to produce butter of first-class quality.
11. If 1 lb. of butter is produced from $2\frac{3}{4}$ gallons of milk, calculate the percentage of fat in this milk.

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER 12TH, 13TH, 14TH AND 15TH, 1927.

EXAMINER :

T. J. DRAKELEY, Ph.D., F.I.C., F.C.S.

Two hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

CHEMISTRY AND PHYSICS.

(Only six questions to be answered.)

1. Explain exactly what is meant by the term "specific gravity," and describe two methods by which the specific gravity of milk may be determined. Of what value is such an estimation?
2. Describe the apparatus usually employed to register the pressure of the atmosphere and give details of the principle upon which the instrument you describe works in practice.
3. How is phosphoric acid prepared? Describe its appearance and properties, and mention the importance of this substance.
4. What is meant by the terms "saponification" and "saponification value." Describe the method you would employ to determine the saponification value of a sample of butter fat.
5. Write a short essay on "The use of preservatives in milk, cream and butter."
6. The value of a feeding mixture or diet is frequently expressed in terms of the starch equivalent. Explain how the value is determined and its importance in rationing milking cows.
7. Upon what scientific principles does the "Gerber" apparatus operate in the determination of the percentage of fat in a sample of milk? Explain in detail the process employed, and give reasons for the various reagents used in the test.
8. What is the difference between a fat and an oil? State the chemical nature of butter fat, and of margarine, and explain how you would determine whether a sample of butter contained margarine.

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE, READING; ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 12TH, 13TH,
14TH AND 15TH, 1927.

EXAMINER :

R. STENHOUSE WILLIAMS.

Two hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

DAIRY BACTERIOLOGY QUESTIONS.

1. What are the possible causes of "ropiness" in milk? Give a short account of the steps you would take in order to find and then eradicate the cause of this fault on a dairy farm.
2. Write a short account of the procedure necessary for the production of milk of low bacterial count on a farm on which hand milking is practised and the milk is sent away in 10-gallon churns.
3. What is the cause of "Blueing" in Stilton cheese? What are the factors which tend to promote or prevent this change?
4. How would you prepare and maintain a pure culture starter? Describe the predominating organisms found in starter.
5. How may milk become infected with the bacillus of typhoid? What are the chief characteristics of a typhoid epidemic due to milk?
6. What are the relative values of (1) the "reductase" test and (2) the plate count and coliform test as measures of the bacteriological condition of milk?

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE, READING; ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 12TH, 13TH,
14TH AND 15TH, 1927.

EXAMINER :

H. W. KERSEY.

Two hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

BOOK-KEEPING. QUESTIONS

(All questions to be answered. Marks are given for neatness and style.)

A dairy farmer starts business with a capital of £3,500 and enters a farm on 30th September, 1926, rented at £425 per annum.

During the year he has the following transactions :—

Pays fire insurance premium, £5 10s., of which 15s. is for insurance of house furniture					£	s.	d.
Pays the outgoing tenant for tenant right	...	...			450	10	6
Purchases implements, dairy utensils and horses...	...	...			710	0	0
Purchases dairy stock	...	...	...	...	1,750	0	0
Purchases pigs	...	...	...	...	40	0	0
Places on deposit at his bankers	...	...	...	...	500	0	0
Makes a contract with the Overend Dairy Co. to supply 80 gallons of milk daily at 1s. per gallon from April 1st to September 30th, and at 1s. 4d. per gallon for the winter months. During the year he receives cheques from them amounting to £1,500							
Draws for private use during the year	...	...	...		300	0	0
Buys seed corn and seed potatoes	...	...	...		120	0	0
Pays income tax, as follows:—							
Landlord's	...	...	...	£68	0	0	
Self	...	...	...	10	0	0	
							78 0 0

[P.T.O.]

Pays the half-year's rent, less the tax	£	s.	d.
Buys manures from Good & Co.	130	15	0
Sells 6 fat calves at £5 5s. each to A. Masterman, who fails and pays 6s. 8d. in £			
Sells corn and potatoes	285	5	9
Buys foodstuffs £700, of which £50 is outstanding at the end of the year			
Draws a cheque for £50, out of which he pays in cash :—			
Market Expenses	£14	10	6
Postage and Stationery	5	4	6
Sundry Small Bills	12	8	9
Casual Wages	15	0	0
Transfers £400 from his Deposit Account to his Current Account			
Pays wages	818	0	0
Settles Good & Co.'s account less 5 per cent. discount			
Sales for surplus milk and dairy produce amount to ...	88	5	6
Sells pigs	90	10	0
Sells 2 draft cows at £23 each, less auctioneer's charges, 30s.			
Owes his landlord half-year's rent			
His bankers credit his Current Account with £15 for interest on his deposit			
Dairy produce consumed in the house	35	15	0
His valuations on 30th September, 1927, are :—Live Stock £1,965, Dairy Produce £2 10s., Tenant-right £380, Crops £200; his Horses and Implements depreciate 10 per cent.			

NOTE.—Payments are made by cheque except where otherwise stated, and all receipts are paid into the bank.

Enter the above transactions into the proper account books and show the result of the year's trading.

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON MONDAY,
TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER
12TH, 13TH, 14TH AND 15TH, 1927.

EXAMINER :

R. H. EVANS, B.Sc.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Discuss the food value of (a) Whole milk; (b) Separated milk; (c) Butter-milk.
2. What effect has (a) heating; (b) cooling on milk? Explain the uses of both processes in practical dairying.
3. Write what you know of the colouring matter in butter. How do you account for the absence of colour often met with in butter?
4. How much butter would you expect to get from (a) 75 gallons of milk containing 3.7 per cent. of fat; (b) from 7 gallons of cream containing 37 per cent. fat.
5. Describe the steps you would take in washing the churn used for buttermaking.
6. What is separator slime? Explain why it is always advisable to examine this substance before it is washed off.
7. If you were asked to judge a number of samples of butter, explain the method you would adopt.
8. When a sample of butter is found to be tainted, explain what steps you would take to ascertain the cause thereof.
9. How do you account for (a) the necessity of ventilating the churn, soon after churning has commenced; (b) the fact that the temperature of the cream usually rises during the process of churning.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON MONDAY,
TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER
12TH, 13TH, 14TH AND 15TH, 1927.

EXAMINER :

C. W. WALKER-TISDALE.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Explain the importance of humidity in relation to cheese-making.
2. State the advantages and disadvantages of the use of Starter in cheesemaking.
3. What factors would influence you in deciding the amount of rennet to add to milk for cheesemaking?
4. Give in tabular form the composition of milk and show what happens to the constituents when the milk is converted into cheese.
5. Contrast the amount of ripe cheese you would expect to get respectively from milk containing 3 per cent., 3·5 per cent., 4 per cent. and 4·5 per cent. Fat.
6. You are asked to judge a class of Cheddar cheese containing twelve entries. State how you would proceed to do this.
7. State the essential requirements for the production of blue-veined cheese.
8. State the methods employed for pressing cheese.
9. State the essentials for the proper ripening of :—
 - (a) Hard-pressed cheese.
 - (b) Blue-veined cheese.
10. Give a drawing of the double-lever cheese screw press, and explain the method of calculating the pressure exerted.

The British Dairy Farmers' Association.

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 Batten, E. J., Sanatorium Farm, Nayland, Suffolk.
 Baxendale, Lt.-Col. J. F. N., Froxfield Green, Petersfield, Hants.
 Bayley, A., Orchard Bungalow, Lent Rise, Burnham, Bucks.
 Bayley, Comdr. J., R.N., Willaston Hall, Nantwich.
 Bazeley, J. C., Gurlyn Barton, St. Hilary, Marazion, Cornwall.
 Beale, Capt. B. P., M.C., Hillcote Farm, Purley, near Pangbourne, Berks.

- Beatty, A. Chester, Calehill Park, Little Chart, Kent (Agent, W. J. Raymond).
 Beckett, A., Clive, Middlewich, Cheshire.
 Beckett, John, junr., Chells Hill Farm, Betchton, Sandbach, Cheshire.
 Beckett, T. E., Hall o'Coole, near Nantwich, Cheshire.
 Bedford, Geo. Smith, University College, Reading.
 Bellamy, Douglas R., Sandfield, Chislehurst, Kent.
 Bennett-Stanford, Lt.-Col. J., Hatch House, Tisbury, Wilts.
 Bennion, Miss Nellie, Cheshire School of Agriculture, Reaseheath, Nantwich.
 Bentall, C. E., Five Corners, Wickham Bishops, Essex.
 Bentall, E. E., The Grove, Witham, Essex.
 Benyon, H. A., Upton Court, near Reading.
 Benyon, J. Herbert, J.P., Englefield House, Reading, Berks.
 Berkeley, R. G. W., Spetchley Park, Worcester.
 Berry, Grosvenor, Mount Bures, Bures, Suffolk.
 Bethell, Thomas P., Crown Works, Boundary Place, Liverpool, Lancs.
 Betts, Walter, Moreton, Thame, Oxon.
 Bill, Ernest E., New Mills Dairy, Ledbury, Herefordshire.
 Billson, Mrs. Emily M., 33, St. Anne's Road, Eastbourne.
 Bingley, Thomas H., Whitley Hall, Grenoside, Sheffield.
 Birkbeck, Major H. A., Westacre Abbey, King's Lynn (L.M.).
 Birkbeck, Martin, Poringland, Norwich.
 Birkbeck, Oliver, Little Massingham, Massingham, Norfolk.
 Birkett, E., F.Z.S., F.R.H.S., Beddlestone Farm, Brook, Ashford, Kent.
 Birmingham Dairy Co., Limited (represented by W. T. Harrison), Dalton Street, Birmingham.
 Bishop, J. P., Moor View Lodge, Pennsylvania, Exeter.
 Black, Sir R. A. S., Bart., Midgham Park, Reading (L.M.).
 Blackburn, C., Head Street, Liverpool, Lancs.
 Blackburn, Miss E. M., Cheshire School of Agriculture, Reaseheath.
 Blackshaw, J. F., Restormel, Harlow, Essex.
 Blackstone & Co., Ltd. (represented by G. M. Blackstone), Rutland Iron Works, Stamford, Lincs.
 Bland, G. R., County Offices, Oxford.
 Bledisloe, Lord, P.C., K.B.E., Lydney Park, Gloucestershire (L.M.).
 Blewitt, G., Boxted Hall, Colchester.
 Blundell, Stanley, Green Gore, Battle, Sussex.
 Bodega, J. F., 19/20, Cowcross Street, London, E.C. 1.
 Bodman, W. J., Manor Farm, Ogbourne St. George, Wilts.
 Body, J. B., M.I.C.E., Hindhead Court, Hindhead, Surrey.
 Boggild, Professor Bernhard, Frydendalsvej 2 V, Copenhagen (H.M.).
 Bohrmann, A. H. L., Winkhurst Green, Ide Hill, near Sevenoaks (L.M.).
 Bolitho, Lt.-Col. E. H. W., Trengwainton, Heamoor, Cornwall.
 Bolton, Edgar O., Leeming, Watermillock, Penrith.
 Bolton, Herbert James, Waltham Cross, Hertfordshire.
 Bond, Capt. K. H., Wood End, Harpenden, Herts.
 Bond, A. E., Lloyds Bank Chambers, New Street, Birmingham (L.M.).
 Booth, G. W., Ion Farms, Lower Gravenhurst, Ampthill, Beds.
 Booth, Miss C. A. M., Yore Croft, Ripon, Yorks.
 Boscawen, Lady Margaret F. L., Mount Street, London, W. 1.
 Boscawen, Sir Arthur G., 80, Cornwall Gardens, London, S.W. 7.
 Bostock, Harold S., Haslington, Crewe.
 Bourne, A. J., Brough Hall, Gnosall, Staffs.
 Bourne, Felix, 226, High Street, Chatham.
 Bourne, J. H., Hack Green, Nantwich, Cheshire.
 Bourne, T., Baddington, Nantwich, Cheshire.
 Boutflour, R., B.Sc., Harper Adams Agricultural College, Newport, Salop.
 Bowden, James, Lance Levy Farm, Sherfield, Basingstoke.
 Bowden, Tom, Vyne Farm, Basingstoke.
 Bowen, Miss May, The Poplars, Milton, Pembroke.

- Bowen-Colthurst, Miss P. de B., Laver-de-la-Haye, Colchester.
 Bower, Norman, Smeaton Wood, Wrenbury, Nantwich, Cheshire.
 Bowles, Eustace, Far Croft, Market Drayton, Salop.
 Bowser, Benjamin G., Scothern Manor, Lincoln (L.M.).
 Boyes, Miss K., County Offices, Oxford.
 Boyle, Prof. C., University College, Cork.
 Bradford, William L., Pendleton, Manchester, Lancs.
 Bradish-Ellames, Mrs. A. G., Manor House, Little Marlow, Bucks.
 Brady, W. H., Glan-y-coed, Penmaenmawr, Carnarvon.
 Brake, P. W., Burnt House Farm, Cranmore, Shepton Mallet.
 Brander, Miss Anna E. L. (L.M.).
 Brassey, Capt. R. B., J.P., Cottesbrooke Hall, Northampton (L.M.).
 Bray, Miss Evelyn, County Education Office, The Castle, Exeter.
 Brazil, W., Kidmore Game Farm, Kidmore, near Reading.
 Bretherton, Miss A., The Moothall, Newcastle-on-Tyne.
 Briggs, Capt. William, St. Clere, Kemsing, Sevenoaks, Kent.
 Briggs, Mrs. H., The Grange, North Stoke, nr. Wallingford.
 Brindley, Frank, Cottage Farm, Sandybrook, Ashbourne, Derbyshire.
 Brine, Miss G. B., c/o Barclays Bank, Old Bank, Oxford.
 Brise, A. W. Ruggles, Spains Hall, Braintree, Essex.
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 British Sulphate of Ammonia Federation, Ltd. (represented by D. M. Watson), 30, Grosvenor Gardens, Westminster, London, S.W. 1.
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 Brittain, Miss M., Somerset Farm Institute, Cannington Court, Bridgwater.
 Bittlebank, Col. J. W., C.M.G., M.R.C.V.S., D.V.S.M., 1, Mount Street, Manchester.
 Brocklehurst, W. S., J.P., Grove House, Bedford.
 Bromet, John, Golf Links Farm, Tadcaster.
 Brook, F. R., Belgrave House, Moretonhampstead, South Devon.
 Brook, Lt.-Col. Charles, Kinmount, Annan (L.M.).
 Brooke, Charles E., Roseberry, Malford Grove, Snaresbrook, E. 18 (L.M.).
 Brooking, W. E., Furzedown, Malborough, Kingsbridge.
 Brooks, C. H., Park Lodge, Mistley, Essex.
 Broom, T. W., Sondes Place Farm, Dorking, Surrey.
 Broome, A., & Sons, (represented by W. A. Broome), Preston Brook, Cheshire.
 Broughton, J. F., Yeabridge, South Petherton, Somerset.
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 Brown, A. & J. (represented by Mrs. A. Brown), Hedges Farm, St. Albans.
 Brown, Alexander, Saudford, Wolverton, Basingstoke.
 Brown, A. Milner, Woodlands, Bathealton, Taunton.
 Brown, A. O., Capton, Halwell, Totnes, S. Devon.
 Brown, D., Beauchamps, Southchurch, Essex.
 Brown, E. J., Thornholme, Brigg, Lincs.
 Brown, Admiral F. C., C.B., C.M.G., Stamford Place, Faringdon, Berks.
 Brown, G. B. M., Manor House, Heacham, near King's Lynn, Norfolk.
 Brown, H. A., Grendon, Atherstone, Warwickshire.
 Brown, James A., 31, Bridge Street, Bristol.
 Brown, John H., Shrewbridge House, Nantwich, Cheshire.
 Brown, Oscar C., Appleby, Lincolnshire.
 Brown, W. C., Appleby, Lincolnshire.
 Bruce, N. M., Clarendon Park Estate Office, Clarendon, Salisbury.
 Bruce, R. J., Elmhurst Farm, Slinfold, Sussex.
 Brunton, W., Marton, near Middlesbrough, Yorks.
 Bryan, Frank, 122, Newgate Street, London, E.C. 1.
 Bryan, Robert, British Dairy Institute, Reading.
 Bryant, H. G., Street Farm, Bovingdon, Boxmoor.
 Buckley, T. H. W., The Grange, Crawley Down, Sussex.

- Buckley, Wilfred, Moundsmere Manor, Basingstoke.
 Bucknell, J., & Sons, (represented by Mrs. Jane Bucknell), Priory Farm, Beech Hill, Reading (L.M.).
 Bull, A. C., County Dairy School, Sutton Veny, Warminster.
 Bull, Mrs. Ida M., The Offices, Sutton Veny, Warminster.
 Bull, Miss Iris L., 5, Ashen Road, Clare, Suffolk.
 Bullivant, Percy, Tunworth, Basingstoke.
 Burchnall, J. O., Manor House, Aston Flamville, Hinckley.
 Burdon, Col. Rowland, J.P., Castle Eden, Co. Durham.
 Burge, Joseph R., Itchen Down, Itchen Abbas, near Winchester.
 Burgess, J. W., Helmons, West Hanningfield, near Chelmsford.
 Burkitt, William, Grange Hill, Bishop Auckland, Durham.
 Burnard, A. (Burnard & Son), 31, Bond Street, London, S.E. 8.
 Burrell, Lt.-Col. Sir Merrik R., Bart., C.B.E., Knepp Castle, Horsham.
 Burton, Baroness, Dochfour, Inverness.
 Burton, W., Appleby House, Parkstone, Dorset.
 Bush, B. S., Manor Farm, Laverton, near Bath.
 Bush, John H., Peart Farm, Norton St. Philip, Bath.
 Busk, Mrs. M. A., Wraxhall Manor, Dorchester, Dorset.
 Butcher, H. W. (representing O'Brien & Butcher), 37/38, Mark Lane, E.C. 3.
 Butter, Col. C. A. J., Clunimore, Pitlochry, Perthshire.
 Buxton, Capt. R. G., Petygards, Sporle, King's Lynn.
 Buxton, Major G. J., Tockenham Manor, Wootton Bassett, Wilts (Agent :— W. H. Mullan, Estate Office).
 Buxton, Sir T. Fowell, Bart., J.P., Woodredon, Waltham Abbey (L.M.).
 Buzzard, Brig.-Gen. F. A., West Haxted Farm, Edenbridge, Kent.
 Byrne, Miss N. C., 11, Parnell Square, Dublin.

- CADBURY, Mrs. G., M.A., O.B.E., J.P., Manor House, Northfield, Birmingham.
 Caddick, Lt.-Col. E. W., 10, Conduit Road, Bedford.
 Caillard, Miss G. L., Devon Banks, West Hill, Ottery St. Mary, Devon.
 Caillard, Sir Vincent, Wingfield House, near Trowbridge, Wilts.
 Cain, Sir Ernest, Bart., Exors. of, Wargrave Manor, Wargrave, Berks.
 Caldwell, James, Moorfield, Kilmarnock.
 Calley, Miss J. M., Burderop Park, Swindon.
 Calthrop Bros., Ltd. (represented by G. A. Squirrel), Naylor Street, Liverpool.
 Calvert, Horatio, Bourne Place, Hildenborough, Kent (L.M.).
 Campbell, R. G., Pickhurst Manor, Hayes, Kent.
 Candler, G. A., 258, Brixton Hill, London, S.W. 2.
 Cannell, George W., Hardley, near Loddon, Norfolk.
 Capstick, E., St. Patrick's Hall, Reading.
 Carlton, Mrs. F. S., Eastwood Park, Falfield, Glos.
 Carrington, H. B., Blacklands, Crowhurst, Sussex.
 Carson, R. W., Lea Hall, Hatfield Heath, Essex.
 Carter, A. E., Brook House, Great Baddow, Essex.
 Carter, Edward, East Upton, Ryde, Isle of Wight (L.M.).
 Carter, James & Co. (represented by G. Beale), 237/8, High Holborn, W.C. 1.
 Carwardine, Mrs. M., Whitcross Court, Whitchurch, near Bristol.
 Case, Capt. H. A., Court Farm, Beckford, near Tewkesbury.
 Cash, T. E., Brockhill Farm, Redditch, Worcs.
 Cataline Co., Ltd. (represented by J. H. Fursdon), Bristol.
 Cater, Mrs. B., 76, St. James Court, London, S.W. 1.
 Cathcart, Miss D., Aubrey Farm, Keyhaven, Lymington, Hants.
 Cautley, Miss M. A., Oakley, Hants.

- Cecil, Lady Arthur, The Mount, Lymington, Hants.
 Cecil, Lt.-Col. R. E., D.S.O., Passford House, Lymington, Hants (L.M.).
 Chadborn, Dr. C. N., 10, Cambridge Road, Hove, Sussex.
 Chalk, Vernon Beecher, Beckenham, Kent.
 Challenger, Miss E., Greenhill, Woolhope, Ledbury, Herefordshire.
 Chalmers, W. S., Moothall, Newcastle-on-Tyne.
 Champion, R. W., 41, Triangle West, Clifton, Bristol.
 Champion Bros., Mill Farm, Steeple Ashton, Trowbridge.
 Chance, S. M. M. C., M.A., Spinningdale, Bonar Bridge, Sutherland.
 Chaplin, Col. J., The Brow, Overton, Ellesmere, Salop.
 Chapman, Frederick, Chevet Grange, Wakefield.
 Cheke, Miss V. E., The Cockpit, Fair Oak, Hants.
 Chick, John H., Wynford Eagle, Dorchester, Dorset.
 Chick, W. D., Compton Valence, Frampton, Dorchester, Dorset.
 Chillingworth, A. F., & Sons (represented by A. F. Chillingworth), Reddown Farm, Highworth, Wilts.
 Chiswick Soap & Polish Co. (represented by C. Mason), Chiswick, W. 4.
 Chivers & Sons, Ltd. (represented by John Stanley Chivers), Histon, Cambs.
 Christie, Capt. J., M.C., Glyndebourne, Ringmer, Lewes.
 Clare, A. J., Market Place, Wells, Somerset.
 Clark, H. J., Oldner House, Chipping Norton, Oxon.
 Clark, Thomas, Beeches Farm, Botcherby, Carlisle.
 Clarke, Col. Stephenson R., C.B., J.P., Borde Hill, Cuckfield, Sussex.
 Clarke, E. H., Cossington Grange, Leicester.
 Clarke, E. W., Chilborough House, Aylesbury, Bucks.
 Clarke, P. R., Boltons Park Farm, Little Heath, Potters Bar.
 Clarke, R. A., & Sons (represented by C. J. Clarke), Manor Farm, Chiselborough, Stoke-under-Ham.
 Clay, Col. H. H. Spender, C.M.G., Ford Manor, Lingfield, Surrey.
 Clayton, G. S., St. Anne's Works, St. Anne Street, Limehouse, E. 14.
 Cleaves, C. E., J.P., Sproutes, Coolham, Sussex.
 Clement, Sir Thomas, 27, South Albion Street, Glasgow.
 Clifford, Major A. F., J.P., Park Place, Wickham, Hants.
 Clifton-Brown, E., J.P., Burnham Grove, Burnham, Bucks (L.M.).
 Coalston, H., Homebank, Haddington, Scotland.
 Cochrane, A., Nether Craig, Kilmarnock (L.M.).
 Cochrane, J., West of Scotland Agricultural College, Kilmarnock.
 Cochrane, John, Byreholm, Thornhill, Dumfriesshire (L.M.).
 Cochrane, M., Catlins, Lockerbie, Dumfriesshire.
 Cohen, Miss C. E., 31, Oxford Square, London, W. 2.
 Cole, G. R., Manor Dairy, Closworth, Sherborne.
 Cole, Henry F., Tilly Manor Farm, West Harptree, Bristol.
 Cole, W. E., Dyrham, Staple Hill, near Bristol.
 Colebrook, W. M., The Meadows, Claygate, Surrey.
 Collet, Sir Mark E., St. Clere, Kemsing, Sevenoaks.
 Collins, William, Crafton, Leighton Buzzard, Beds.
 Collins, W. H., Whitehouse Farm, Bruton, Somerset.
 Colnett, Miss A., County Offices, Oxford.
 Colt, W. H., Ltd., Bush House, Aldwych, London, W.C. 2.
 Compton, A. H., 136, Kensington Park Road, London, W. 11 (L.M.).
 Comyns-Lewer, Mrs. E., 2, Oakwood Avenue, Beckenham, Kent (L.M.).
 Conroy, George L., Douglas Wharf, Putney, London, S.W. 15.
 Constable, Mrs. M., Nizels Hoath, Hildenborough, Kent.
 Cook, Miss E. G., Cold Harbour, Stadhampton, Wallingford, Berks.
 Cook, William, & Sons (represented by A. J. Thompson), Orpington House, St. Mary Cray, Kent.
 Cook, William H., Cook's Poultry Farm Ltd., Orpington, Kent.
 Cooke, Miss W. M., Crook Farm, Denton, Ben Rhydding.
 Cooper, Cecil M., Tudor House, Haslemere.

- Cooper, Major R. W., Rush Court, Wallingford, Berks.
 Cooper, Sir George A., Bart., Hursley Park, Winchester (Agent, T.W. Ashton, Estate Office, Hursley Park, Winchester, Hants).
 Coote, Col. Charles H. Eyre, Highgate House, Creaton, Northampton.
 Copeland, L. F., The Slade Farm, Hedgerley, Farnham Royal, Bucks.
 Copleston, Mrs. T. H. H., Widworthy Rectory, Honiton, Devon.
 Copley, S. W., Deacons Hill, Elstree, Hertfordshire.
 Corbett, Hon. Godfrey, M.C., Rowallan, Kilmarnock (L.M.).
 Corby, J. Stanley, Cuckmans, St. Stephens, St. Albans.
 Corfield, Capt. R., Jordans, Ruspur, Sussex (L.M.).
 Cornall, Fred, Lake Hill, Bury, Lancs.
 Corner, Dr. Harry, Brook House, Southgate, N. 14.
 Cornish, Mrs. C. J., Steyne, Bembridge, Isle of Wight.
 Corrie, Harold, Heath House Farm, Lowfield Heath, Surrey.
 Coryton, Capt. J. T., Pentillie Castle, St. Mellion, Cornwall.
 Coryton, Miss J. E. L., Fursdown, Plympton, S. Devon.
 Coster, J., & Sons (represented by J. Coster), Gouda, Holland.
 Cotterell, R. L., Ruscombe, Twyford, Berks.
 Courtenay, Capt. P. D. A., Greenlawn, Burnham-on-Sea, Somerset.
 Courthope, Col. Sir G. L., Bart., M.P., Whiligh, Sussex.
 Coward, Miss F., Cumberland & Westmorland Farm School, Newton Rigg, Penrith.
 Cowdray, Viscount, Cowdray Park, Midhurst, Sussex.
 Cowell, Miss Mary A., Callows Hill, Ledbury, Herefordshire.
 Cowlard, Mrs. P., Stuart Lodge, Appleshaw, Andover.
 Cowley, William A., Ovingdean Grange, near Brighton, Sussex.
 Cox & Sons (represented by A. Cox), Northwold Buildings, Northwold Road, Stoke Newington, London, N. 16.
 Cox, Harry T., Bishops Stortford Dairy Farms, Bishops Stortford, Herts.
 Cox, James, jun., Manor Road Farm Dairy, Barnet, Herts.
 Cox, Miss E. Lilian, Chewton Field Farm, Chewton Mendip, Bath, Somerset.
 Cox, Miss J., 13, Appian Way, Leeson Park, Dublin.
 Cox, William J., The Cardiff Milk Supply, City Road, Cardiff, Glam.
 Crabtree, G., Greystone Manor, Burley-in-Wharfedale.
 Crabtree, James, 25-39, Price Street, Birkenhead, Cheshire (L.M.).
 Cranfield, H. T., Midland Agricultural and Dairy College, Sutton Bonington, Loughborough.
 Cranworth, Lord, Grundisburgh Hall, Suffolk.
 Craufurd, Mrs. E. L. H., Dunlop Place, Dunlop, Ayrshire.
 Crawford, Hugh W. B., Forneth, Castle Douglas.
 Crawford, Lady Gertrude, Coxhill, Lymington, Hants (L.M.).
 Crawford & Cox, The Misses, Cottage Farm, Warsash, Southampton.
 Crawler, Miss F. M., N.D.D., B.D.F.D., 1, Richmond Road, Exeter.
 Crewe, Marquis of, P.C., D.C.L., Crewe House, Curzon Street, W. (Communications to Prof. W. McCracken, Englesea House, Crewe).
 Crompton, Chas. W., Hall Green, near Wakefield, Yorks.
 Crompton, James R., Greenhayes, Banstead, Surrey.
 Cross, George, British Empire Hotel, De Vere Gardens, Kensington, W. 8.
 Cross, J. L., Catthorpe, Rugby.
 Crow, Robert, Jealots Hill Farm, Bracknell, Berks.
 Crowe, John, Estate Office, Ashe Warren, near Basingstoke.
 Crowson & Son (represented by I. Bidwell), 61, Charterhouse Street, E.C. 1.
 Croxon, A. B., The Limes, Burnham-on-Crouch, Essex.
 Crumpler, Jesse, Longlands, North Coker, Yeovil.
 Crutcher, G. J., Duncroft Lodge, Reigate, Surrey.
 Cruwys, R. L., Sherwood, Sidmouth Junction, Devon.
 Cumber, W. J., Theale, Berkshire.
 Cundy, J. P., Estover, Crownhill, nr. Plymouth.
 Cupiss, F., Ltd. (represented by W. Clarke), The Wilderness, Diss, Norfolk.

- Currie, Laurence, Minley Manor, Farnborough, Hants.
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 Curtis, R., Edina, Stoneygate, Leicester.
 Curzon, C., Westaway, Milford Haven, Pembrokeshire.
- DAIRY, THE (represented by J. W. Hand), 21, Farringdon Avenue, E.C. 4.
 Dairy Outfit Co., Ltd. (represented by W. P. Freeth and J. H. Stanley), 251, Pentonville Road, King's Cross, London, N. 1.
 Dairy Supply Co., Ltd. (represented by Capt. C. C. F. Smith, M.C.), Museum Street, W.C. 1.
- Dalrymple, Miss Mary, Elliston, St. Boswells.
 Dalrymple-Hamilton, Col. N., Bargany, Girvan, Ayrshire (L.M.).
 Daresbury, Lord, C.V.O., Walton Hall, Warrington (Agent: Capt. J. Bainbridge, Walton Estate Office, near Warrington).
 Darling, F., Education Sub-Office, Aylesbury.
 Darlington, J., Pitton Grange, Burlton, Shrewsbury.
 Darrell, Miss Mary, Ebberston, Snainton, S.O., Yorkshire.
 Dartmouth, Earl of, P.C., K.C.B., Patshull, Wolverhampton.
 Davidson, J. D., 5, Pembroke Terrace, Cardiff.
 Davies, Ben, 28, King Street, London, W. 1.
 Davies, Miss Alice, Llysfas Farm Institute, Ruthin, Denbighshire.
 Davies, B. L., Pantyrhaid, Boncath, S. Wales.
 Davies, Edward, Plas Power Home Farm, Wrexham.
 Davies, General H. F., Elmley Castle, Pershore (L.M.).
 Davies, H. J. P., Pixley Court, Ledbury.
 Davis, Colonel, Salt Hill House, Slough, Bucks.
 Davy, A. Cedric, Paternoster Row, Sheffield, Yorks.
 Dawson, George, Dawson Bros., Leeds, Yorks.
 Dawson, Miss E. M., 1, College Hill, Shrewsbury.
 Day, C. F. (representing Day & Day), 237-239, Lower Clapton Road, E. 5.
 Day, Charles T., 237-239, Lower Clapton Road, Clapton, London, E. 5.
 Day, John, Huxham, Shepton Mallet.
 Day, Major E. C., Becketts, Chiddingstone, Kent.
 Day, Son, & Hewitt (represented by G. S. Hewitt), 22, Dorset Street, W. 1 (L.M.).
- Dean, F. W., St. Germain's Farm, St. Albans, Herts.
 Dearden, Miss D. V., British Dairy Institute, Reading.
 De Bathe, Lt.-Col. Max, c/o Lloyds Bank Ltd., 6, Pall Mall, London, S.W. 1.
 Debenham, Miss Alice (representing Messrs. E. R. & A. Debenham), Bladen Dairy Farms, Brians Puddle, Dorchester.
 de Clermont, P. E., Ivy House, Lingfield, Surrey.
 de Garis, E., Myrtle Place, Castel, Guernsey.
 de Kusel, C., 32, Iron Mill Lane, Crayford, Kent.
 De la Warr, Earl, Fishers Gate, Withyham, Sussex.
 Delmé-Radcliffe, Lt.-Col. A., D.S.O., Shenley House Farm, Headcorn, (L.M.).
 Denchfield, F. T., Manor House Tingwick, Buckingham.
 Dennis, Mrs. Cyril, Oakley Hall, Market Drayton, Salop.
 Derby, Earl of, K.G., Knowsley, Prescott, Lancs (all communications to The Manager, The Home Farms, Knowsley, Prescott).
 Derisley & Son (represented by L. R. Derisley), Devonshire House, Byfleet.
 Desborough, Lord, G.C.V.O., Taplow Court, Taplow, Bucks.
 de Trafford, Capt. H. E., M.C., Newsells Park, Barley, Royston.
 de Trafford, Sir Humphrey, Bart., 10, Grassington Road, Eastbourne (L.M.).

- de Wackenfelt, M., Swedish Legation, 27, Portland Place, W.1. (H.L.M.).
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 Dewe, W., Ashampstead, near Reading.
 Dickie, Robert, Knockenjig, Sanquhar, Dumfriesshire.
 Dickinson, B. O., Pharos, Burnham-on-Sea, Somerset.
 Dickson & Robinson (represented by F. Robinson), Cathedral Street, Manchester.
 Dickson, Miss K., Sutton Place Cottage, Abinger, Surrey.
 Dillon, Miss A. D., 7, Dyke Parade, Cork.
 Dimmock, J. B., Shotford Hall, Harleston, Norfolk.
 Dobson, P., Manor Farm, Ridgwardine, Market Drayton.
 Dolbear, John, Queen Street, Newton Abbot, Devon.
 Done, John, Manor House, Malpas, Cheshire.
 Doughty, Wilfrid V., J.P., Ickleford Manor, Hitchin, Herts.
 Douglas, Comdr. C. A. O., R.N., Hazells, Newbury.
 Douglas, John, 142, Hanham Road, Kingswood, Bristol.
 Douglas, Loudon Macqueen, Newpark, West Calder, Midlothian.
 Dover, J. G., The Homestead, Gt. Missenden, Bucks (L.M.).
 Doyle, Miss A. M., Munster Institute, Cork.
 Doyle, Miss J., c/o Secretary, Committee of Agriculture, Monaghan, Ireland.
 Drakeley, Dr. T. J., Ph. D., M.Sc., F.I.C., F.C.S., M.I.M.E., 69, Rosebery Road, Muswell Hill, London, N. 10.
 Drew, Edward T., 110, Dunvegan Road, Eltham, S.E. 9.
 Drummond, J. N., Bargower, Hurlford, Ayrshire.
 Drummond, Prof. R. J., Ingersol, Kilmarnock.
 Drysdale, John, 5, St. Andrew Square, Edinburgh.
 Ducker, N. B., Thorney House, Thorney, Colnbrook, Bucks.
 Dudgeon, Major C. Randolph, Cargen-Holm, Dumfries.
 Dugdale, A. N., Dutton Manor, near Longridge, Preston.
 Dugdale, Major J. Gordon, The Abbey, Cirencester.
 Duncan, John, Kingston-on-Soar, Derby.
 Dunkels, W., Fernhill Park, Windsor Forest, Berks.
 Dunlop, George, Craigaploch, Castle Douglas.
 Dunlop, Quintin, Greenan, Ayr.
 Dunn, Henry (L.M.).
 Dunstan, Mrs. R. J., Porloe, Mylor, near Falmouth.
 Dunstan, R. J., Porloe, Mylor, near Falmouth.
 Dutton, B. T., Brindley Hall, Nantwich (L.M.).
 Dwight, A. G., Ashton, Wimborne, Dorset.
 Dyer, W. T., Grauntcourts, Rayne, Essex.
 Dyer & Son (represented by T. Dyer), Illston, Billesdon, Leicestershire.

- EARL, Henry F., Biddenden, Kent.
 Easton, Edward G., 43, Gt. Tower Street, London, E.C. 3.
 Eaton, George T., Thurston Hall, Framfield, Sussex.
 Ebdon, Miss M. P., West Farm, Fulwell, Sunderland.
 Edmead, John W., Bury Fields House, Guildford.
 Edwards, Henry, Hofland Road, West Kensington, London, W. 14.
 Edwards, John, Newton, Ellesmere, Salop.
 Edwards, Lt.-Col. C. W., Woolston, North Cadbury, Somerset.
 Edwards, Major B. M., Hardingham Hall, Hingham, Norfolk.
 Edwards, Miss Katie, Ty-draw Farm, Nelson, near Cardiff.
 Edwards, Sidney, Blackbirds' Nest, Bassaleg, Newport, Mon.
 Edwardes-Ker, Lt.-Col. D. R., Seale Hayne Agricultural College, Newton Abbot.

- Eglinton and Winton, Earl of, Horns Lodge, Tonbridge, Kent.
 Elce, Mrs. Amy, Barings Field, Newdigate, Surrey.
 Ellinger, Prof., Landbohojskole, Copenhagen (H.M.).
 Elliott, C. C., Aston Abbotts, Aylesbury.
 Ellison, R., Colonial House, Tooley Street, London, S.E. 1.
 Elmhurst Farming and Trading Co., Ltd. (represented by H. St. George Voules), Elmhurst Farm, Slinfold, Sussex (L.M.).
 Elwes, Lt.-Col. W., Oakdale, Ockley, Surrey.
 Emberton, William, Home Farm, Doddington, Nantwich, Cheshire.
 Emerton, Frank, 78, Grange Drive, Winchmore Hill, N. 21.
 Emerton, H. J., Halesworth, 76, Windmill Hill, Enfield.
 Enamelled Metal Products Corporation, Limited (represented by C. J. Porter), 56, Kingsway, London, W.C. 2.
 Enoch, Arthur Guy, Dutch House, Raglan Gardens, Wembley Park.
 Enock, G., Margaret Street Works, Windus Road, N. 16 (L.M.).
 Enock, A. G. & Co., Ltd., (represented by E. C. Rayner), Thane Works, Angel Road, Edmonton, N. 18.
 Entwisle, J. F., Crigglestone Manor, nr. Wakefield.
 Errington, Roger, Victoria Mills, Sunderland.
 Erwood, H. J., 47, Whitworth Road, Plumstead, London, S.E. 18.
 Evans, J., Harrington House, Cheltenham.
 Evans, Miss D. M., University College of Wales, Aberystwyth.
 Evans, J. M., 34, Westbourne Terrace North, Paddington, W. 2.
 Evans, Richard H., Barclays Bank Chambers, Pwllheli, Carnarvonshire.
 Evans, Sir Walter H., Bart., Wightwick Hall, near Wolverhampton.
 Evelyn, Mrs. J. H. C., Wotton House, near Dorking, Surrey. (All communications to Estate Office, Wotton, Dorking.)
 Evens, John, Burton, Lincoln.
 Evens, John, junr., Burton, Lincoln (L.M.).
 Evens, Thomas, Ramsland, Yealmpton, Devon.
 Everard, W. Lindsey, Ratcliffe Hall, Leicestershire (L.M.).
 Ewing, Hugh, Birtley Farm, Bramley, Guildford, Surrey.
 Ewing, M., Ashlands House, Crewkerne, Somerset.
 Ewing, W., Gate Street Farm, Bramley, Surrey.
 Exeter Co-operative & Industrial Society, Ltd. (represented by F. Hannaford), 6 & 7, Eastgate, Exeter.
 Express Dairy Company, Limited (represented by R. H. Hewson), Tavistock Place, London, W.C. 1.
 Eyre, George, 18, Redcliffe Square, London, S.W. 10.
 Ezra, Capt. E., Lock, Partridge Green, Sussex (Agent: F. P. Musgrave).

- FARMER, JOHN T. H., Devon, Crippenham, Bucks.
 Farmers' and Cleveland Dairies Company, Ltd. (represented by J. T. Horner), 12 and 13, East Street, Gifford Street, Caledonian Road, London, N. 1.
 Farmers' Clean Milk Dairies, Ltd. (represented by T. W. Steer) 16/18, Greyfriars Road, Reading.
 Farwig, H. A., Mapleton Dairy Company, Mapleton Farm, Edenbridge, Kent.
 Fawkes, F. H., Farnley Hall, Otley, Yorks.
 Fawkes, Tennyson, Church Farm, Leonard Stanley, Stonehouse, Glos.
 Fearnall, P., Calverhall, Whitchurch, Salop (L.M.).
 Feilding, Lt.-Col. Viscount, C.M.G., D.S.O., Street Ashton House, Rugby.
 Fenn, H. E., Market Buildings, Guildford.
 Ferrand, G. F., Clanville Lodge, Andover, Hants.
 Fewings, J. H., Ferndale, Bream, Glos.

- Fewson, Mrs. A., 17, Ripplevale Grove, Barnsbury, London, N. 1.
 Finch, J. W., Market Buildings, Guildford.
 Fish, A. R., Holme Mead, Hutton, near Preston.
 Fisher, Charles V., Crescent Farm, Sidcup, Kent.
 Fisher, Fred T., Pinkneys Court, Pinkneys Green, Maidenhead (L.M.).
 Fison, Joseph, & Co., Ltd. (represented by Harry M. Ennals), Ipswich.
 FitzGerald, Lady, Buckland, Faringdon, Berks.
 FitzGerald, Sir John, Bart., M.C., Warren House, Stanmore.
 FitzHugh, G. E., Plas Power, Wrexham.
 FitzRoy, Capt. The Hon. E. A., M.P., Fox Hill, West Haddon, Rugby.
 Fitzwalter, Lord, Goodnestone Park, near Canterbury, Kent.
 Fleming, Miss E. W., Chilworth Manor, Romsey, Hants.
 Fletcher, H. G., The Galloway Creamery, Ltd., Stranraer.
 Fletcher, Miss M. J., 28, Park Road, Chelmsford.
 Folkestone, Viscount, Longford Castle, Salisbury (L.M.).
 Follett, Lt.-Col. H. S., C.B.E., Rockbeare Manor, near Exeter.
 Follows, A. J., Metchley Park, Edgbaston, Birmingham, Warwickshire.
 Foot, Asher, Manor Farm, Charlton, Shepperton.
 Foot, Mrs. R. M., White Hill, Berkhamsted (L.M.).
 Forester, Capt. F., M.F.H.
 Forshaw, James, & Sons, Stud Farm, Carlton-on-Trent, Newark.
 Fortescue, Earl, Castle Hill, South Molton, North Devon (L.M.).
 Fortescue, George G., Boconnoc, Lostwithiel, Cornwall.
 Forteviot, Lord, Dupplin Castle, Perthshire (L.M.).
 Fortnam, Joseph T., Rudge Manor, Ashley, Market Drayton.
 Fortune, Robert, Newhouse, Cranleigh, Surrey.
 Foster, A. V. B., Wrawby Top, Brigg, Lincs.
 Foster, Thomas, 27, Church Street, Ormskirk, Lancs.
 Four Oaks Spraying Machine Co. (represented by W. C. G. Ludford), Four Oaks, Sutton Coldfield, Birmingham, Warwickshire.
 Fowler & De la Perrelle (represented by T. W. Brider), Porters Lane, Southampton.
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 Fownes, Mrs. I., Briar Thicket, Yetminster, Sherborne, Dorset.
 Foxton, J., Benningholme Hall, Skirlaugh, near Hull.
 Francis, E. J., Manor Farm, Stour Provost, Gillingham, Dorset.
 Francis, F. S., Wilkin Throop Farm, Templecombe, Somerset.
 Franklin, Mrs. C., Chartridge Lodge, Chesham, Bucks.
 Franklin, H., Coltsfoot Farm, Datchworth, Herts.
 Frederickson, Capt. F., Holbrook, Ockley, Surrey.
 Freeman, Miss Z. S., Dial House, Shepperton-on-Thames.
 Freeth, H. C., 93, Redland Road, Bristol.
 French, G., 16, Winterwell Road, Brixton Hill, London, S.W.2.
 French, W. T., & Son (represented by A. E. French), St. Mary Street, Ladywood, Birmingham.
 Fricker, B. J., East Sussex Agricultural Institute, Plumpton, Sussex.
 Frieland, H. N., 67, Scrutton Street, London, E.C.2.
 Frost, E. G. G., J.P., West Wrating Hall, Cambridge.
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 Fuller, Major Robert F., J.P., Great Chalfield, Melksham, Wilts (L.M.).
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 Fulton, Robert, Rectory Farm, Ridgeway, Enfield.
 Furber, P. J., Melton Lodge, Whitchurch, Salop.
 Furneaux, G., Luson, Yealmpton.
 Furneaux, J. E., Sparkwell, Staverton, Devon.
 Furness, E., Gt. Amwell House, Ware, Herts.
 Furze, J. R., Stanford Rivers, Ongar, Essex.

- GABELL, C. D., Ltd. (represented by C. D. Gabell), 104, Albion Road, Stoke Newington, London, N. 16.
- Gamage, A. W., Ltd. (represented by John S. Parker), Horticultural Dept., Holborn, E.C. 1.
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- Garne, W. T., Aldsworth, near Northleach, Glos. (L.M.).
- Garner, Frank H., University Farm, Huntington Road, Cambridge.
- Garnett, G., The Park, Eccleshill, Bradford.
- Garrad, G. H., Springfield, Maidstone.
- Garrard, F. R., The Hall, Framlingham, Suffolk (L.M.).
- Garrard, Miss M. C., Sanforth, Clevedon, Som.
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- Gascoigne Co., Ltd. (represented by G. H. Gascoigne), Lyndford House, Castle Street, Reading.
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- Ghosal, B. N., 36, Snow Hill, London, E.C. 1.
- Gibson, J. & H., Priestlands, Dumfries.
- Gibson, Mrs. M., Cofton Farm, Starcross, near Exeter.
- Gilbert, C. E., The Grange, Melbourne, near Derby.
- Gilbert, F. W., The Lawn, Chellaston, Derby.
- Gilbert, F. W. H., junr., The Manor, Chellaston, Derby.
- Gilbert, W. H. R., The Cottage, Aston Flamville, Hinckley.
- Giles, Henry, Stockers Farm, Rickmansworth, Herts.
- Gillett, Arnold, Ridgewood, Chorley, Lancs.
- Gilmour, W. P., Balmangan, Kirkcudbright.
- Gisborne, Col. L., C.M.G., Lingen Hall, Brampton Bryan, Herefordshire (L.M.).
- Gittins, William H., The Hall Farm, Ruyton-of-the-Eleven Towns, Shropshire.
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- Golding, W. J., Bowens, Penshurst, Kent.
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- Gordon, Miss M. E., 51A, Ashby Road, Loughborough.
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- Gosney, G. F., Cecil Chambers, Room 412, 76/86, Strand, W.C. 2.
- Gould, R. P., Beech Croft, Costessey, Norwich.
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- Grace, E. G., Woolston Farm, Stogursey, near Bridgewater.
- Graham, S., Horton Hall, Small Dole, Sussex.
- Graham, Wm., Eden Grove, Kirkbythore, Penrith, Cumberland (L.M.).
- Grant, A. P. F., M.B.E., Kirby Hall, Horton Kirby, Kent.
- Grant, Mrs. M. A., Kirby Hall, Horton Kirby, Kent.
- Grant, Reginald, Box 23, Shaw Nigan Lake, British Columbia.

Grant, R., Customs Branch, Australia House, Strand, W.C. 2.
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 Gray, George E., Fairstead, Great Warley, Essex (L.M.).
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 Green, Edward, Ina Works, Ingatestone, Essex.
 Green, H., Tanyard Farm, Oakhill, Bath.
 Greenslade, A. T., Little Walden Park, Saffron Walden.
 Greenwood, Lt.-Col. Charles S., M.B.E., J.P., Swardcliffe, Birstwith, Harrogate.
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 Grehan, Miss Rita, 7, St. Mary's Road, Dundalk.
 Griffin, E., 84, High Street, Slough.
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 Griffith, M., B.Sc., County Offices, Dolgelley, Merionethshire.
 Griffiths, Miss M. F., 1, St. Peter's Terrace, Cambridge.
 Grimsdale & Sons, Ltd. (represented by E. W. Grimsdale), 54, Great Tower Street, London, E.C. 3.
 Grimsdell, Henry John, 36, Snow Hill, London, E.C. 1.
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 Gurnell, Frank, West End Farm, Ashby, Scunthorpe, Lincs.

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 Hall, Miss E. M. G., Craycombe House, Pershore, Worcester.
 Hall, R., Ferry, Bere Alston, South Devon.
 Hall, R. Charles, 1 & 2, Sloane Street, London, S.W. 1.
 Hall, Thomas, Marske Farm, Marske-by-the-Sea, Yorks.
 Hallett, C. M., Walronds Park, The Brewers, Taunton.
 Hambleton, Viscount, Greenlands, Henley-on-Thames. (Agent, W. F. Holt Beaver, Estate Offices, Yewden, Henley.)
 Hambro, Sir Eric, K.B.E., Milton Abbey, Blandford.
 Hambro, H. C., The Hyde, Luton, Beds.
 Hamilton, Miss M. H., Coddington Court, Ledbury, Herefordshire.
 Hamilton and Brandon, The Duchess of, Hamilton Palace, Lanarkshire.
 Hamilton of Dalzell, Lord, Dalzell, Motherwell, Scotland.
 Hamlyn & Co., Ltd. (represented by G. W. French), 45, Coplestone Road, Peckham, London, S.E. 15.
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 Hankey, Colonel Walter A. (L.M.).
 Hannot, F. Charles, Saltwood House, Hanworth Road, Hounslow.
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 Harding, C. H., Grittleton, Chippenham, Wilts.
 Harding, E. G., J.P., Fosote, Grittleton, Chippenham, Wilts.

- Hardman, N., The Elms, Barton, Preston, Lancs.
 Hardy, Charles, Argos Hill, Rotherfield, Sussex.
 Hare, Lady Kathleen, Brokenhurst Park, Brockenhurst, Hants.
 Hare, C. W., Woodside, Stonelot Hill, Sutton, Surrey.
 Hare, G. F., Trafford Road, Wisbech, Cambs.
 Harewood, Earl of, Harewood House, Leeds, Yorks.
 Harford, M. W., Horton Hall, Horton, near Bristol.
 Hargreaves, Miss E., Nazeing Park, Essex, via Waltham Cross.
 Hargreaves, Miss L., Nazeing Park, Essex, via Waltham Cross.
 Hargreaves, Miss M., Nazeing Park, Essex, via Waltham Cross.
 Harlech, Lord, Brogyntyn, Oswestry.
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 Harries, T. Ll., Pilrthoth, Llanstephen Road, Carmarthen.
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 Harris, Stanley, Aspley Guise, S. O., Bedford (L.M.).
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 Harrison & Sons (represented by J. Harrison), St. James Street, Leicester.
 Harrison, McGregor & Co., Ltd. (represented by T. D. Harrison), Albion Iron Works, Leigh, Lancs.
 Harvey, D. G., Wooston Farm, Moretonhampstead, South Devon.
 Hasler & Co. (represented by W. Hasler), Dunmow, Essex.
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 Hatchwell, Miss H. M., 38, Abbotsbury Road, Newton Abbot.
 Hatfield, E., Ministry of Agriculture and Fisheries, Welsh Office, Aberystwyth.
 Hawes, F., Little Compton, Moreton-in Marsh, Glos.
 Hawes, Miss G. B., Frenches Farm, Chipperfield, Herts.
 Hawkins, A. W. Bailey, The Garage, Whitwell, Welwyn.
 Haworth, Alfred, B.A., J.P., Ravelstone, Manley, Warrington.
 Hay, A., East Anglian Institute of Agriculture, Chelmsford.
 Hay, Percy T., 3, Brookfield Park, Highgate Road, London, N.W. 5.
 Hay, W. D., B.Sc., Somerset Farm Institute, Bridgwater, Somerset.
 Haydon, D., 63, Honor Oak Road, S.E. 23 (H.M.).
 Hayes, G. Constable, The Greenway, Shurdington, Cheltenham.
 Hayes-Sadler, Lt.-Col. J., White Coppice Poultry Farm, High Hurstwood, Uckfield.
 Haynes, W. E., Bletchington, Oxon.
 Hayward, Colonel J. F. Curtis, Quedgeley, Gloucester (L.M.).
 Hearnshaw, Mrs. R. Fletcher, Foxhill, Burton Joyce, Nottingham (L.M.).
 Hearnshaw, R. Fletcher, Foxhill, Burton Joyce, Nottingham (L.M.).
 Heath, Mrs. Enoch, The Elms Farm, Raglan, Mon.
 Heaton, Stuart, Poplar Farm, Iken, Tunstall, Suffolk.
 Heaver, Exors. of the late John W. T., Ratham House, Chichester, Sussex.
 Hebditch, Harry, Poultry Farmer and Appliance Maker, Martock, Som.
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 Henderson, A. Gavin, Buscot Park, Faringdon, Berks. (Agent, Walter Crosland, Estate Office.)
 Henderson, Hon. A. P., Windlesham Park, Windlesham, Surrey (L.M.).
 Henderson, Hon. E. B. B., Winwick Manor, Rugby.
 Henderson, Hon. P., Gerston, Storrington, Sussex.
 Henderson, Miss Marjorie, The Riding, Hexham, Northumberland.
 Herbert, C. A., Heydown Farm, Heathfield, Sussex.
 Herbert, E. G., c/o Lloyds Bank Ltd., 6, Pall Mall, London, S.W. 1.
 Herbert, F. F., The Graig, Penalt, Mon.
 Herrin, Edwin, Champneys, Tring, Herts.
 Herts and Beds Bacon Factory (represented by F. Lawrence), Hitchin.
 Heseltine, Lieut.-Col. John E. N., Hawking Down, Hindon, Wilts.
 Heseltine, Major G., The Hill, Lutterworth.
 Hesketh, Oliver, Cholmondeston, Winsford, Cheshire.

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- Heywood, N. A., J.P., Glevering Park, Wickham Market, Suffolk (L.M.).
- Heywood-Lonsdale, Lt.-Col. H. H., Shavington, Market Drayton, Salop.
- Hicking, Sir William N., Bart., Brackenhurst Hall, Southwell, Notts.
- Hickman, J. P., Micklefield Green, Rickmansworth.
- Higgins, W., Kilburn Lane Farm, Kensal Green, London, N.W.
- Higgs, James, 2, Canterbury Road, Brixton, S.W. 9.
- Hignett, L., Hook End Farm, Checkendon, Oxon.
- Hildage, Miss M., 268, Boldmere Road, Erdington, Birmingham.
- Hill, G., & Sons (represented by E. F. Hill), Evercreech, Somerset.
- Hill, H. B., Broadevell, Moreton-in-Marsh.
- Hill & Fraser, The Misses, Husbands Bosworth, Rugby.
- Hincks, Henry Thorp, Keyham, near Leicester.
- Hindlip, Lord, Hindlip Hall, Worcester. (Agent: Capt. W. Robson, Estate Office, Hindlip.)
- Hinton, Robert J., Heytesbury, Wilts.
- Hiron, H. W. M., Finsbury Pavement House, London, E.C. 2.
- Hirons, W. & J., Great White End, Latimer, Chesham.
- Hirst, R. The Royds, Cleckheaton, Yorks.
- Hitch, W. H., Elkstone Manor, Elkstone, near Cheltenham.
- Hitchen, Thomas L., Highfields, Baddiley, Nantwich, Cheshire.
- Hoare, Sir H. H. A., Bart., Stourhead, Zeals, Wilts.
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- Hobson, J. T., & Co. (represented by F. C. Eccles), New Wharf, St. Mary's, Bedford.
- Hobson, W. H., Woodhey Hall, Nantwich.
- Hodge, Mrs. Arthur B., The Redings, Totteridge, London, N. 21.
- Holborrow, J. P., Northfield Farm, Charlton Kings, Glos.
- Hole, Sidney, Yew Tree House, Albourne, Hassocks, Sussex.
- Hollingworth, E., C.B.E., Moordale, Dobcross, Yorks.
- Holm, H. C., The Grange, Carlton Curliu, Leicester.
- Holman, H., J.P., Holcombe Down, Teignmouth, Devon.
- Holmes, Carl, Clover Top Farm, Welwyn, Herts.
- Holmes, John, 6, The Gardens, Vaughan Road, Harrow.
- Holmes, W. F., The Thatched House, Hampton Wick, Middlesex.
- Holmes-Hunt, W., Crawley Down, Sussex.
- Holt-Thomas, G., North Dean House, Hughenden, Bucks.
- Holzappel, Max, The Marians, Elstree, Herts.
- Hony, H. C., Hallam, Ogbourne, Marlborough.
- Hooker, John Henry, The Firs, Buckingham.
- Hoole, Mrs. G., Ivy Mount, Bolton Road, Chorley, Lancs.
- Hope, H. E., Hope's Wharf, Hammersmith, London, W. 6.
- Hopson, Miss M. L., 18, Erskine Hill, Hampstead Garden Suburb, N.W. 11.
- Hopwood, A. A., Mouldsworth Hall, Chester.
- Hornby, W. E., Keynsham Manor, Saltford, Som.
- Hornby & Clarke (represented by H. E. Hornby), 12, The Quadrant, Richmond, Surrey.
- Horne, H. S., Aldsworth Farm House, Emsworth, Hants.
- Horne, W. Edgar, Hall Place, Shackleford, Godalming, Surrey.
- Horridge, J., Plas Llanfair, Llanfair P. G., Anglesey.
- Horticultural College (represented by Miss K. Barratt), Swanley, Kent.
- Horton, S. S., Lixton, Loddiswell, Devon.
- Hosier, A. J., Wexcombe House, Marlborough, Wilts.
- Hosking & Sons (represented by O. H. Hosking), Fentongollan, Probus, Cornwall.
- Hoskyns, H. W. W., North Perrott Manor, Crewkerne, Som.
- Hough, C. W., Springhouse Farms, Thcydon Bois, Essex.
- Houldsworth, Lt.-Col. W. T. R., Kirkbride, Maybole, Ayrshire.

Howard, H. G., Blue House, Pitsea, Essex.
 Howard, Miss Margaret, 15, Victoria Square, Newcastle-on-Tyne (L.M.)
 Howard, Robert, Pound Farm, Esher, Surrey.
 Howie, James, Hillhouse, Kilmarnock.
 Howkins, Rex, Clifton Reynes, Newport Pagnell, Bucks.
 Hoyle, J. J., Chase Cottage Farm, Potters Bar, Middlesex.
 Hudson, James, 8, Garden Road, Bromley, Kent.
 Hughes, Herbert E., The Bungalow, Broxbourne, Herts.
 Humphreys-Owen, Major A. C., J.P., Glansevern, Berriew, S.O., Mon.
 Hunt, A. H., Dropping Lane Farm, Bruton, Som.
 Hunt, James, Ltd. (represented by E. A. Hunt), Atalanta Street, S.W. 6.
 Hunt, Miss M. A., 184, Kensington Road, Reading.
 Hunt, W., Diptford Downs, Diptford, S. Brent, S. Devon.
 Huntbach, F., Moor Hall, Aston, Nantwich.
 Hunter, J. A., & Co., Ltd. (represented by H. M. Blackburn), Bootle, Lancs.
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 Hunting, J. C., Pankridge Farm, Gt. Missenden, Bucks.
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 Hussey, W. J., St. Peter's, Brundall, Norwich.

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 India, Offg. Inspector General of Agriculture in (S. Milligan, M.A., B.Sc., Pusa, Bihar).
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 Ireland, Miss Ellen L., East Balmirmer, Arbroath, Scotland.
 Isbell, C. J., Polmarkyn Farm, St. Germans, Cornwall.
 Ismay, James H., Iwerne Minster House, Blandford, Dorset.
 Ive, C., New Haw Road, Addlestone, Surrey.
 Iveagh, Earl of, C.B., C.M.G., 11, St. James's Square, S.W. 1.

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 Jackson, Miss A., Shirehall, Hereford.
 James, J., Sheepcourt Farm, Bonvilstone, Cardiff.
 James, Miss E. E., Copt Heath Farm, Solihull, Warwickshire.
 James, Miss Rachel, Llan Cayo, near Usk, Mon.
 Jameson, J. M., Beacon Hill, Penkridge, Staffs.
 Jamieson, J., Round Bush, Annan, Dumfriesshire.
 Jarmay, I. B. & H. L. (represented by R. B. Jarmay), Bulkeley Hall, Malpas.
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 Jeal, W. A., Cedar Poultry Farm, Hounslow, Middlesex.
 Jeffrey, A., 70, High Street, Walthamstow, E. 17.
 Jenkins, T. E., Kilorough Farm, Parkmill, Glam.

Jenkinson, F. H., 14, Church Lane, Handsworth, Birmingham.
 Jenkinson, W. D., 14, Church Lane, Handsworth, Birmingham.
 Jennings, John E., Restormel, Lostwithiel, Cornwall.
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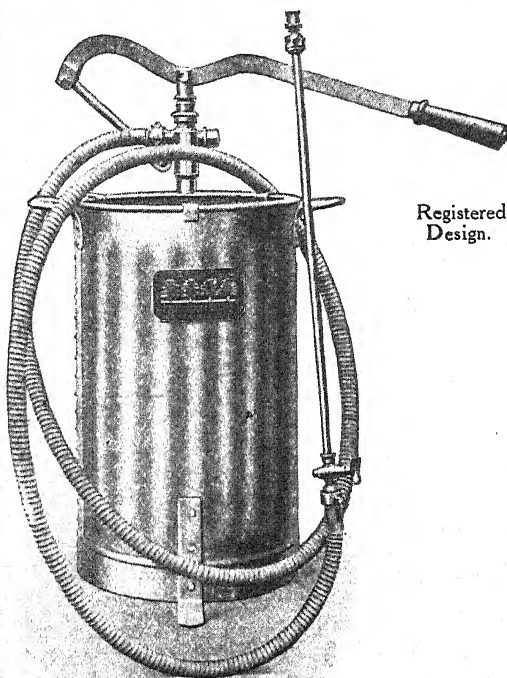
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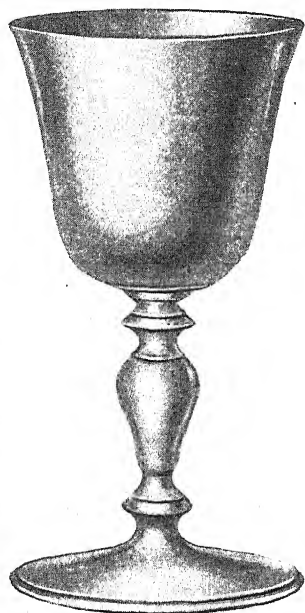
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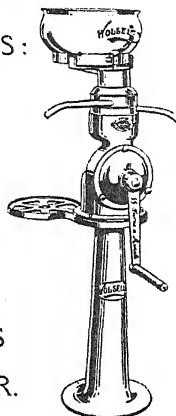
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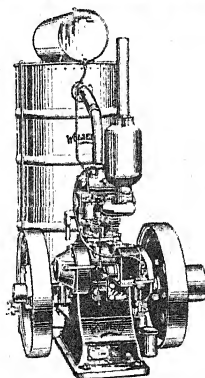
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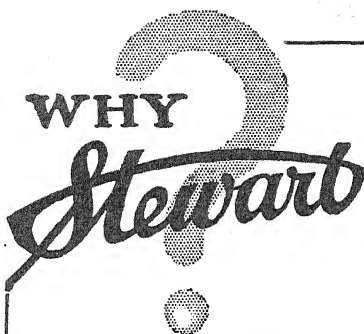
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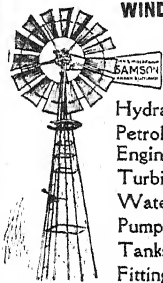
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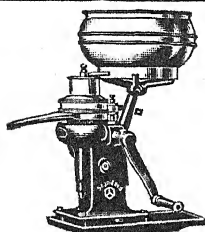


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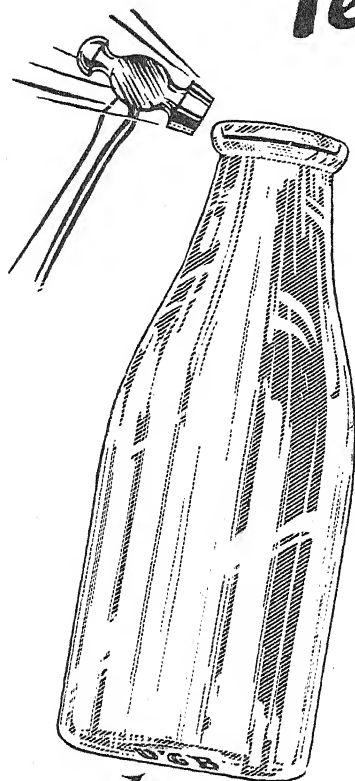
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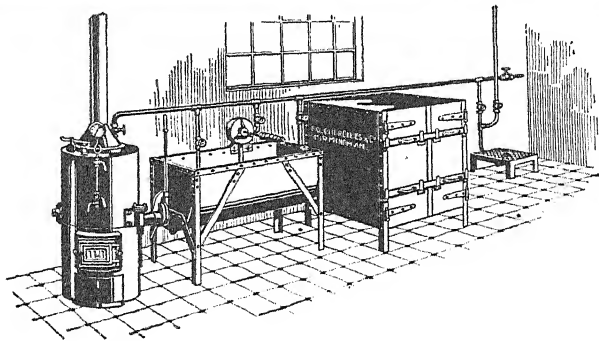
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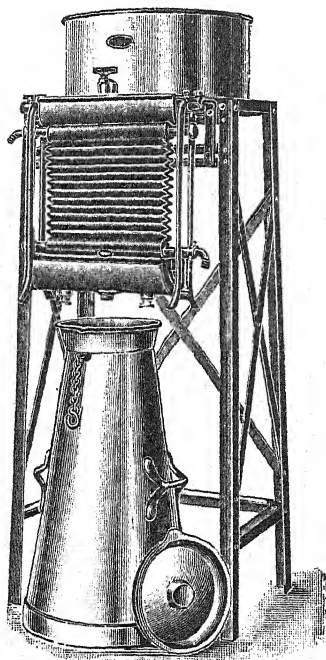
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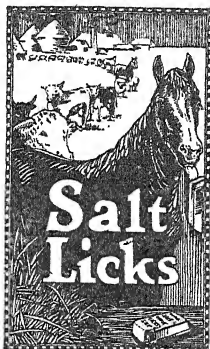
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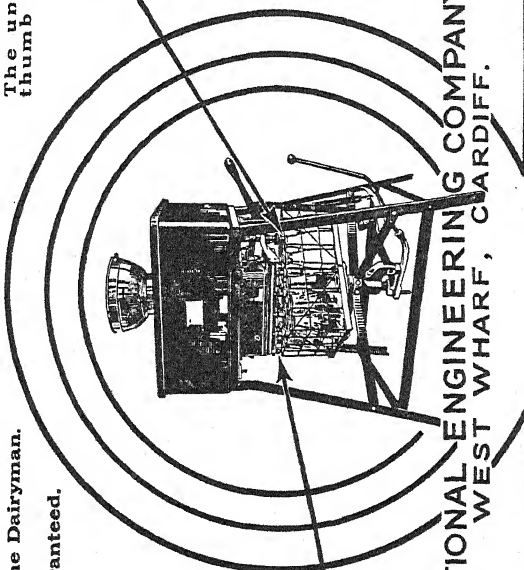
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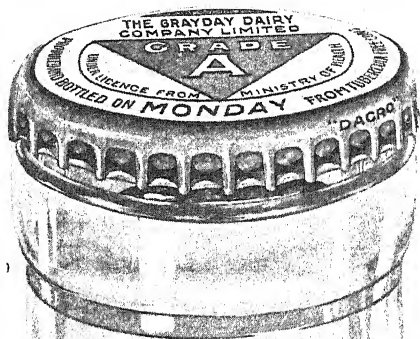
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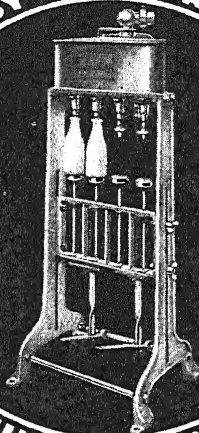
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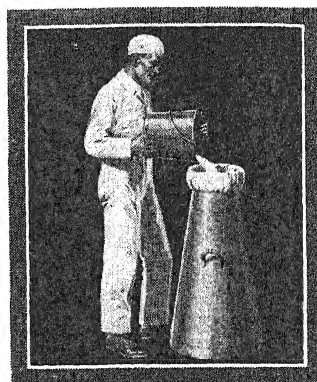
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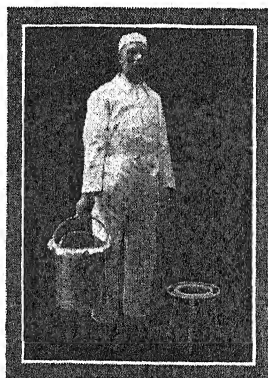


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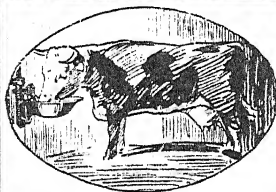
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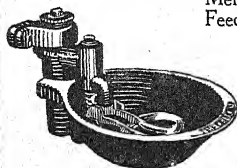


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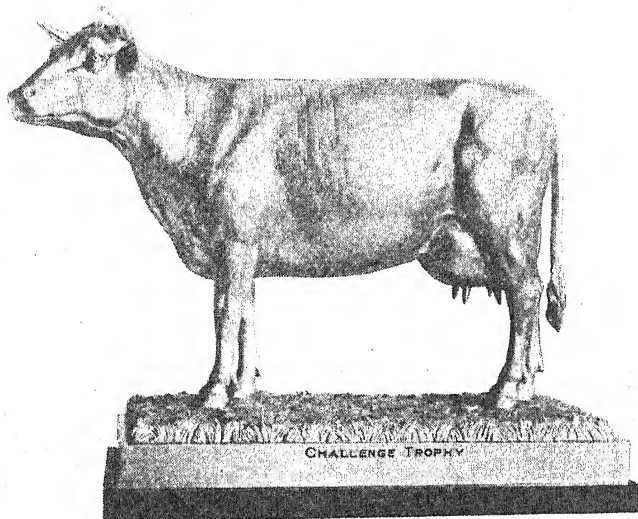
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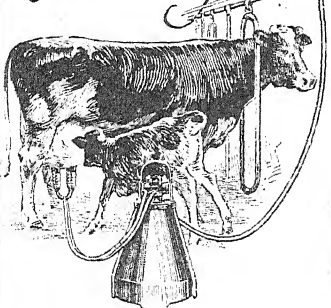
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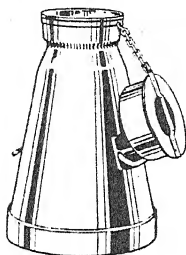
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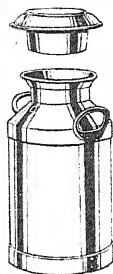
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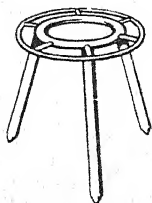
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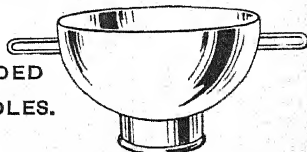
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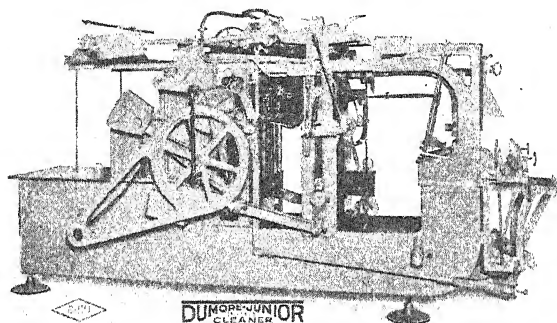


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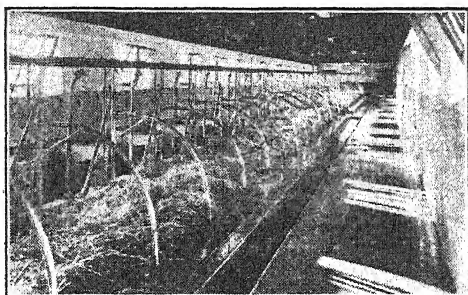
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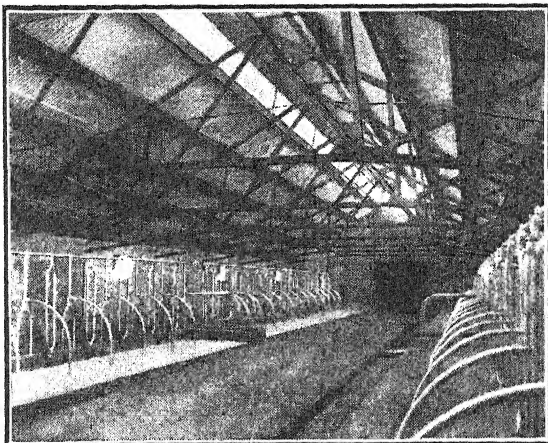
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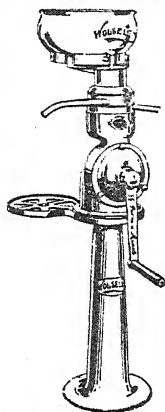
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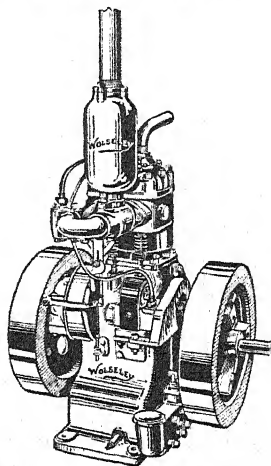
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1929

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THE IMPROVEMENT OF HERBAGE PLANTS.

By PROFESSOR R. G. STAPLEDON, M.B.E., M.A.,
and T. J. JENKIN, M.Sc.

UNTIL comparatively recently the improvement of grassland has only been considered from the point of view of the application of manures and general schemes of management, the possibility of improving the herbage plants in the manner so successfully applied to cereals and other arable crops not having been seriously taken into account. Herbage plants should, however, from one point of view rank as rotational crops—for they are sown in large amounts every year. It has been estimated that over a million acres are annually sown to rotation leys (of various degrees of duration) in England and Wales. In addition to this the ploughing of worn-out permanent grass with a view to re-seeding has now been shown frequently to be the most satisfactory method of grassland improvement.

It follows, therefore, that there is almost unlimited scope for the intervention of improved strains of grasses and clovers into both the rotational leys and the poorer of the permanent pastures of the country.

The value of strain has, of course, in a general way been appreciated, as is proved by the esteem in which wild white clover is now held by all who have tested it in comparison with ordinary commercial white Dutch, as well as by the growing realisation that ordinary broad red clover and late-flowering red clover (or single cut cowgrass) are to be regarded as two quite distinct varieties of red clover.

The difference between these two varieties is, however, far greater than between the spring varieties of oats for example, and is quite as great as the difference between say Grey Winter and a spring variety like Victory. The farmer will not use a spring oat for autumn sowing, although he might use a winter oat for early spring sowing. The two varieties of red clover, from the point of view of their application, are no more interchangeable than are winter and spring oats—a fact, however, which is very far from being generally realised, as is shown by the relatively small demand for the all-important late-flowering red clover.

The late-flowering red clovers are the hardiest and longest persisting, and within this group of clovers there exist quite a number of important strains having special purpose uses. The best examples

are the extra-late and extra-persistent closely related (in type), Montgomery red and Cornish marl-strains which are coming into growing popularity for the longer duration leys in the West of England and in parts of Scotland.

With reference to grasses, two examples may be cited of strain difference that is readily apparent in the seed as ordinarily obtainable. In the case of cocksfoot, seed from New Zealand gives a longer lasting plant and more leafy sward than does that from Denmark, while in the case of perennial rye-grass, seed taken with that of wild white clover off old permanent pastures gives a more durable sward than does the ordinary seed of commerce harvested off short duration leys. These facts are, however, not at all generally appreciated, for the demand for New Zealand cocksfoot is not insistent, while the number of farmers who act on the knowledge that wild perennial rye-grass may be as valuable as wild white clover in a seeds mixture is at present almost negligible.

The differences as to strain mentioned above should serve to show the enormous possibilities that exist for the improvement of herbage plants. Broadly speaking, improvement is only possible in a species that shows a wide range of variation, and it is in this connection that our herbage plants afford such unique material with which to work. At the Welsh Plant Breeding Station, for example, large populations of cocksfoot, the rye-grasses, timothy, meadow fescue, red fescue, sweet vernal grass, as well as red clover, white clover, bird's foot trefoil and lucerne, have been brought together from all parts of the country and from sources outside Britain. In each of these grasses and clovers the variation within the species is little short of remarkable.

CHARACTERISTICS OF ECONOMIC USEFULNESS.

In connection with any studies having for their aim crop improvement it is of the first necessity to size up the characteristics that make for economic usefulness. It must be remembered that the greatest advances made by the plant breeder have not been concerned only or even mainly with yield.

Perhaps one of the chief aims of the plant breeder should be to develop strains or sorts that will make it possible to grow a particular crop or species under conditions where formerly such a crop or species could not be economically grown—such has been the aim and successful accomplishment of much of the world's wheat breeding. Great advances have also been made in breeding for the subtle property, quality, as exemplified by Sir Rowland Biffen's work on wheat and the advances made relative to high yielding, high grade malting barleys. But as a forerunner to these successful accomplishments there had to be a vast amount of research leading to a proper appreciation of just those characteristics of the plant which make for quality.

The actual plant breeding has always to follow in the wake of a complete exploration of economic needs and of the properties of the plants favourable to these needs.

With herbage plants, the widest possible field of investigation opens itself to those whose concern it is to define and appraise the economic qualities of species in terms of characteristics of which the plant breeder can avail himself. It is largely on this account that a great many years of painstaking research must elapse before the farmer can hope to have put at his disposal new and improved strains of even the most generally used grasses and clovers.

From the researches so far conducted it is, however, possible to particularise some of the properties that undoubtedly make for usefulness, and to form a correct estimate of the growth factors operating within the plant that influence favourably the properties that are to be desired. It will, perhaps, be informing to give a few examples in terms of what the farmer expects from his grasslands and in the light of recent investigations.

Persistency.—At the present time when the tendency is to put fields down to grass for longer and longer periods, nothing is so important as the capacity for long life of the species and strains sown. Persistency appears to be definitely correlated with two properties of the plants—these are the capacity to tiller or branch profusely and to make a close and more or less prostrate growth. Plants with a too erect habit of growth are so readily and completely defoliated by the grazing animal that they are all too frequently left with an insufficient display of leafage to maintain healthy development. Very close growing plants like wild white clover and many of the indigenous types of our grasses, no matter how hard the grazing, are never completely defoliated.

Correlated with a tendency to close growth and with a capacity for profuse branching is the property of lateness. The persistent strains of herbage plants are almost invariably the late strains—thus wild white clover flowers later than white Dutch, the late red clovers later than the broad reds, and the dense indigenous strains of grasses later than the early erect strains.

The work conducted at Aberystwyth has now gone far enough to show that very great advances can be made as to persistency. Plots sown down with pedigree (indigenous) strains of cocksfoot, compared with ordinary Danish both sown pure and in mixtures, have now been down for five years, and under heavy grazing the indigenous strains are still thick on the sward, while the Danish is only present in very small amount.

The poorer the conditions, the higher the elevation, the lower the fertility or the more unsatisfactory the soil as to free drainage, the greater has been the relative success of the indigenous strains.

Perhaps more remarkable has been the undoubted persistence under heavy grazing of pedigree strains of "pasture" timothy. Sheep show an unflinching preference for timothy, but despite exceptionally heavy selective grazing a timothy sward has been well maintained for two years, while adjoining plots sown with ordinary North American seed now contain a negligible number of timothy plants.

The work has not advanced so far with red clover, and field trials have not yet been possible with the breeding material available at the Station. A pedigree family worked up from selected and extra-persistent plants of Montgomery red clover in comparison with the ordinary "aggregate" Montgomery has, however, shown exceptionally high winter endurance; the implication being that it will prove perfectly possible to build up more persistent and hardy strains than any yet available, and in this connection crosses now being made with selected wild reds and Montgomery are providing material with undoubted possibilities.

Sustained Productivity and Aggregate Yield.—In a herbage plant, powers of recovery after grazing and the ability to maintain a sustained and prolonged productivity are exceedingly important. The late flowering strains maintain autumn and winter productivity far longer than the early flowering—the early flowering are the most productive early in the year. Early keep and sustained keep appear to be incompatible in one and the same plant. It is doubtful if it will ever be within the competence of the plant breeder to develop a strain having in itself all possible desirable qualities. Early keep, mid-season and late keep can only be provided for by including in the seeds mixture pedigree strains each bred to fulfil its allotted part in the grazing year.

Nutritive Value, Palatability and Edibility.—In the case of "artificial" feeding stuffs, it is generally assumed that chemical composition may be used as a fairly reliable index to nutritive value. Not infrequently also greater stress is laid upon yield of dry matter per unit of area than upon gross yield in fodder root crops. In the latter case, since the composition of the dry matter is relatively uniform, complete analysis is not considered necessary, and where this system holds the field, the breeding of fodder root crops is based largely upon dry-matter yield.

It is probable that nutritive value as judged by chemical composition will never assume the same importance in the breeding of herbage plants, but even here it has been found necessary in approaching the question of improvement to some extent to study this aspect. The results for different species are, perhaps, not so striking as might have been expected, but they are yet sufficiently marked to show that certain species in particular have an individuality of their own. Some results already obtained further suggest that appreciable differences may be found between different strains of one and the same species.

Such results are, however, less valuable than those obtained by the study of different parts of one and the same plant. When the herbage is separated into "stem" and "leaf" portions, and these are analysed separately, the difference in chemical composition is found to be very pronounced, the leaf portion consistently showing a far higher nutritive value than the stem.

This fact at once suggests that so long as persistency, and other desirable characteristics are not adversely affected, the plant breeder should work towards an increase in leafiness as a way to improvement. As a matter of fact, it has been found that the leafy types generally are also the persistent types and that they further give high aggregate yields over a number of seasons. The question that now arises is: How far is it practicable to select and breed for high proportion of leaf to stem? This question is really one of economics, since with the great number of plant types available, the limit from the plant breeder's point of view is reached only at the point of complete sterility. To be acceptable, however, a strain must produce such a quantity of seed that the price it demands will make seed growing an economic proposition, and there is not the slightest doubt that strains can be bred which, while relatively very leafy, yet produce a fair abundance of seed. At the same time, it is evident that if and when the farmer demands a more leafy strain, he must be prepared to pay for it in proportion to the benefits he is to obtain. This is not likely to prove a great difficulty. We know that in spite of the high, and sometimes extravagant, price of wild white clover seed, the demand continues, simply owing to the fact that the farmer has been convinced by his own experience that wild white clover is a good thing. In exactly the same way he will be prepared to pay something extra for any improved strain of herbage plant when he has proved to his own satisfaction that it is worth the money. He must remember all the time, however, that he cannot reasonably expect to obtain the seed of an improved, highly leafy and persistent strain at just the same price as one which is highly stemmy and non-persistent.

The benefits to be derived from the use of such a strain in the formation of a pasture are too obvious to need any stressing. Even if the aggregate yield is not increased, so long as it is not actually decreased, any additional leafiness is additional feeding value, and, in fact, if need be, even a slight decrease in aggregate yield might be accompanied by an increase in feeding value if there is a marked increase in leafiness of herbage.

Nutritive value in the sense of chemical composition is, however, only one aspect of a rather complex question, although as far as comparison of leaf and stem is concerned there is nothing further left for discussion since leaf is more palatable and certainly more eatable than stem. Where different species and different strains are concerned, however, the question of palatability and eatability must come under consideration.

Grazing animals show very definite preferences when allowed a free choice of pure plots of various grass species. Thus with sheep, timothy is undoubtedly a great favourite, while they have little use for some of the fine-leaved fescues when they have access to something more to their taste. This, however, is purely a matter of choice as between one species and another, since when no choice is given they will graze these same fine-leaved fescues quite well. Similarly, it has been found that even within the same species they show very definite preferences for certain strains, but here again it is purely a matter of preference, and not a case of the absolute rejection of any one strain.

The existence of these likes and dislikes indicates that the plant breeder's work is not really completed when he has found the strain which in respect of persistency, leafiness and other desirable qualities seems to satisfy all requirements. The palatability of the strain must also be considered, and, as far as possible, he must meet the demands of the grazing animal in this respect. But a strain must not be discarded simply because the animals vote against it under one particular set of conditions. In comparison with others, it may be relatively unpalatable, but it may yet have other qualities which make for special value. Thus in the case of a certain grass, one strain has been relatively poorly grazed as compared with others under good conditions. Under very poor conditions, however, it was the only strain that persisted, and here it was a great favourite as compared with the poor natural herbage which sprang up to take the place of those strains which had disappeared.

Palatability again is not exactly the equivalent to eatability, but it may be exceedingly difficult in all cases to distinguish between them. The difference is, however, well illustrated by the behaviour of sheep on perennial rye-grass plots. All the plots were grazed equally well for the greater part of the season, but the ordinary commercial plot produced flowering stems in far greater abundance than the indigenous types, and therefore became neglected. In this case, there was a choice between stemmy and non-stemmy types, the latter being obviously the more eatable. Similarly, other cases of apparent differences in palatability may, in fact, prove to be differences of eatability due to purely superficial causes such as degree of hairiness and so on.

Disease Resistance.—At first sight, the question of disease resistance in herbage plants would not appear to be a serious one, but the case of red clover at once reminds us that it may be extremely important.

In the case of grasses it is also more important than is always realised. Thus one strain of perennial rye-grass which has given excellent results under certain conditions is notoriously subject to

rust disease, and a bad autumn attack has sometimes resulted in practically the complete disappearance of the plants. Timothy is also very liable to rust, and most of the strains at present on the market suffer heavily in certain seasons.

METHODS OF IMPROVEMENT.

Some of the main characteristics of economic usefulness have now been enumerated, and a brief non-technical outline of methods of improvement may be given. The main principles are very similar in the grasses and in the clovers, but owing to the difference in the type of material available, and in methods of pollination, the technical part of the work in the two cases is not precisely alike.

Up till quite recently, as far as grasses are concerned, very little attention has been paid in this country to the type of plant produced by seed sown. The farmer has been taught to seek a clean seed sample of high germinating capacity and the seedsmen have endeavoured to provide it. To meet the demand of the seedsmen, the seed grower has again advanced a step, and throughout there has undoubtedly been a great improvement as far as seed *qua* seed is concerned. This applies both to imported and to home-grown seed, with the exception that, for instance, in Denmark and in Sweden and also in America (at least in the case of timothy) some attempt has also been made to improve the type of plant.

Where such an improvement of the grass plant has been sought, however, the ideal has been a hay producer rather than a grazed pasture plant. The importance of a degree of leafiness was realised, but not sufficiently to ensure a complete change of type. Consequently, the new strains were generally of the same or nearly the same main type as the old and, on the whole, in the case of cocksfoot, timothy and perennial rye-grass, they were of the erect, stemmy type which could not successfully withstand hard grazing conditions.

It is quite conceivable that this state of affairs was not arrived at purely from choice. In Denmark, for instance, where the land is and has been so largely under cultivation, the range of types of cocksfoot ready at hand for selection purposes was to a great extent limited to the cultivated stocks and what may be termed "escapes." Such cultivated stocks through unconscious selection due to taking seed from young leys, would tend to be of a general type—quick growing, heavy seed producing, but quite unsuited for persisting under grazed pasture conditions.

In our own country, according to Sinclair, perennial rye-grass was keenly studied and a number of improved varieties were introduced more than a hundred years ago. The name of one of these, Pacey's, has persisted, but it may be doubted whether its original characteristics

have been retained. In fact, methods of seed production have undoubtedly in this case also militated very strongly against the retention of such valuable traits as persistency and leafiness, with the result that the present commercial strains are of the early flowering, heavy seed producing, but non-persistent types. Fortunately, we still have in this country stocks of plants which have not been seriously affected by the methods of seed growing that have been practised. These are found in our relatively wide tracts of semi-natural pastures which have been cultivated only to a very small extent over a very long period of time. In the open pasture fields an unconscious selection quite as definite as that which occurs under seed-growing conditions has constantly been in operation. It is, however, very different in kind. Under seed-growing conditions those plants which produce an abundance of seed are automatically selected, irrespective of their other characteristics. Under continuous grazing, plants which produce an abundance of seed are only favoured if they also are persistent under grazing conditions, whereas plants which may not be capable of producing any seed (due to abnormalities or to attacks of *Epichloe*) may be relatively abundant.

The effects of the two systems are very clearly demonstrated when single plants are grown side by side. The seed-growing system appears always to result in the production of early, quick-growing, stemmy types, while continuous grazing encourages the somewhat later, slower-growing, but far more leafy types.

This does not mean that either system must end up with absolute uniformity of type, but rather in the production of a general type which will vary in degree of uniformity from one species to another. Thus, whereas even in the best old pastures the perennial rye-grass plants show a decidedly wide degree of variation, timothy plants vary considerably less—or, at least, the general type is much more definite in the latter than in the former.

These old pastures again are not confined to only one part of the country. Thus, we have excellent old pastures in the Midlands, in the South-east and in the South-west. The pasturing conditions in all these areas may be more or less similar, but we have again differences of soil and climate, so that it does not follow that in all these cases the ultimate type of plant produced is exactly similar in all cases.

There are, again, equally old pastures which are of poorer quality, and these are very widely distributed, while in the hedgerows and waste places surrounding these semi-natural pastures we have conditions under which still further types may be produced.

The result is, that as far as some of the most important grasses are concerned, we have an immense wealth of native material which until quite recently has remained entirely unexplored.

When extensive collections of the various species are made, the most striking feature is the difference in general type between the ordinary commercial and the indigenous. But second only to this is the great variation within the indigenous themselves, particularly in the case of certain species. It may be a marked difference in type, if the source of origin is very different, as, say, in the case of a cocksfoot plant taken from a hedgerow and another taken from an open field. Or, it may be a difference in vigour. Some of the main differences may even be so great that the population may again be classified into fairly definite sub-types, while in other cases it may be so graded that such a classification is impracticable.

Even if a classification into sub-types is possible, the plant breeder will yet find in the first instance that within his sub-types there is no complete uniformity in vigour nor in points of minor importance, so that even in the production of any one sub-type at its best, a great deal of selection is required. After this first selection comes breeding, comparison of progeny and re-selection.

Secondly, with a considerable number of sub-types from which to select he has to decide which of them is likely to prove of the greatest agricultural value. A full solution of this point actually involves the production of sufficient seed of each sub-type to allow for a comparison being made under field conditions—which, in fact, is not generally possible. Thus he must rely upon his own judgment and push forward with those sub-types which he considers to be the most promising.

The work of selection is probably the most difficult of all—or, the position is really better represented by saying that the work of rejection is the most difficult of all. It is quite obvious that from a collection of thousands of plants of any one species only a few can ultimately be retained for breeding work. A great proportion of them must be discarded on appearances only, but there are still left such a number that they cannot possibly all be tested. It is at this point that the great difficulty occurs. Supposing he has to reduce a population of a thousand individual plants to, say, a hundred. He may be able fairly easily to discard the first five hundred, but with each further rejection the uneasy feeling creeps over him more and more persistently that he may be rejecting the wrong plants.

It is only the relatively few that he can really test, either in respect of their own behaviour or in respect of their progeny. And it not infrequently happens that a plant which individually is very promising, is very disappointing when used as a parent.

The study of single plants is, of course, only preliminary. The interaction of two or more plants when bred together follows with a comparison of families so produced, resulting in the rejection of entire families, and rigid selection of individuals in those left. It is only

when the results of inter-breeding of selected plants have been found to be satisfactory that the work of actual strain-building really commences, and here the breeder is greatly handicapped by the fact that his material is naturally cross-pollinated and, therefore, at each step the strain has to be protected from contamination by other strains. This is not very difficult during the initial stages when only a few plants have to be isolated, but it becomes increasingly difficult as the number of plants has to be increased in order to provide sufficient seed for the necessary tests.

The general principles involved in the breeding of red and of white clovers are similar, and in the case of the latter the sources of the material are also very largely the same.

The sources are, however, somewhat different in the case of red clover. It is true that here again wild red clover plants are available, and they may be collected over a very wide area in this and in other countries. But actually it would appear that wild plants in this species are less suitable for the production of improved types than are some of the cultivated types. Wild reds are, of course, carefully studied and are also used for breeding work, but plants of greater promise may be found amongst the cultivated varieties, particularly the extra late.

In the case of this species, the field of selection is again extremely wide. Not only have we our own native varieties, including the early flowering, the late flowering and the extra-late, but in northern Europe and elsewhere large numbers of "local" strains are known and can be drawn upon. Thus, the work of selection and rejection on the one hand, and that of strain building on the other, is no less difficult in red clover than in the grasses, apart altogether from technical difficulties met with in both cases.

All this explains why it takes a long time to develop an improved strain of herbage plant and why the farmer has to exercise patience. In order not to try the farmer's patience too hard, however, new strains are being developed as rapidly as possible. The first strains cannot be expected to be perfect, but if they show a definite improvement upon the ordinary commercial types, the preliminary work of the plant breeder is justified.

HERBAGE PLANT IMPROVEMENT AND THE FARMER.

The first steps towards the improvement of herbage plants in this country were actually taken by the farmer himself. Reference has already been made to the fact that several distinct strains came into existence more than a hundred years ago, but, unfortunately, even the names of most of these have now been forgotten.

More recently, we have the case of wild white clover. In this case, no selection was made, and no breeding, but the improvement brought about by the use of wild white clover seed has been one of the most real in the whole history of agriculture.

Still later has followed the use of wild perennial rye-grass seed. The improvement now obtained is, perhaps, less pronounced than in the case of wild white clover, but still it is a very important one, and it is quite possible that with the adoption of a better system of harvesting, under which it is harvested for its own sake and not incidentally, the improvement might be yet greater.

Relatively pure wild populations of other useful species might be difficult to find, so that it is doubtful whether this system can be extended to other species. There is no doubt, however, that it can be considerably extended in the case of these two, in the sense that a great many farmers should produce their own wild white clover and perennial rye-grass seed for their own use. But it should be done systematically and not in haphazard fashion.

The system of saving home-grown seed is nothing really new in this country. We have the instances of Montgomery red clover, Cornish marl and other strains where in the case of this species the practice has been followed quite extensively. We have also the old practice of sowing hay loft sweepings and seed shed at harvest time. This latter practice was quite haphazard and generally resulted in the sowing of a mixture of objectionable weed seeds accompanied by a sprinkling of valuable seeds. This old practice exactly illustrates what should not be done.

The first essential in saving home-grown seed is that it should be purposeful, and in the case of some of the clovers in this country and particularly in the case of the harvesting of red clover and timothy in northern Europe we have a very clear illustration of what should be done. It should be borne in mind, however, that the harvesting of red clover and timothy is not an exact parallel to that of wild white clover and perennial rye-grass in this country, and it is the general principles rather than the details we would wish to emphasise. The leys are almost without exception of three years' duration, and are mown for hay each season, the seeds mixture used in their formation being red clover and timothy. It may happen that when an exceptionally hard winter occurs, the red clover population of a ley may be greatly reduced by the third harvest year, but the rule is that whenever that is possible, each farmer shall set aside definitely for seed production that part of his third year ley where the red clover stand is most satisfactory. It does not seriously matter whether there is little or

much timothy in this special area, but great care is taken that it should be the area in which the least amount of undesirable plants occur.

Exactly the same care is taken in the selection of the timothy area, and even the occurrence of rough-stalked meadow grass is regarded with disfavour.

These seed production areas of red clover and timothy are a definite feature of the landscape in Northern Sweden and in Norway after the hay harvest, and the harvesting of these areas is quite as definitely a part of the usual farm routine as the harvesting of the corn crops and is given quite as much care and attention.

The features of this practice to be emphasised are, of course, neither the species concerned nor the type of ley from which they are harvested except that the seed whenever possible is harvested from the last year of the ley. This is important, since it shows that a definite attempt is being made to obtain the seed of those plants which have themselves persisted the full length of the customary ley.

This principle is an important one in connection with the harvesting of wild white clover and wild perennial rye-grass seed in this country. The equivalent would be, that since these are mainly to be used for long duration leys, seed should only be harvested from really old pastures, and even the harvesting of once-grown seed from a young ley would be contrary to the principle.

It is known, however, that once-grown wild white clover seed may give excellent results even when harvested from a young ley, but this does not mean that disaster would not follow the repetition of this procedure over a few generations.

In the case of perennial rye-grass, it is doubtful whether even once-grown seed from a young ley would give results at all comparable with those from original seed, and it is highly probable that under ordinary conditions "degeneration" would be very rapid in this species.

The general principle, therefore, holds good, and the farmer should either harvest his seed from original old sward, or, at most, from a sward obtained by the use of original seed, unless many years have been allowed to elapse.

How the age of a field and its management may affect the type of plant produced may be illustrated by means of the case of a field in the Midland counties which has come under our own observation. This field, according to the farmer, was a "new" ley—laid down about thirty years previously. An occasional crop of hay had been taken mainly for the purpose of obtaining grass seed to sow down other fields on a distant part of the farm. Neighbouring fields were

"old" ones and had been continuously grazed. When rootings of several grass species were taken both from the "new" and the "old" fields, the former gave rise to plants distinctly more similar to the commercial types than the latter.

The "newness" of the field was probably only partly responsible for the difference in type, the occasional mowing being also partly responsible. This means that for the production of wild perennial rye-grass seed in particular the same area should not be used too frequently, but should be changed from year to year.

The other point that should be emphasised is, that the area should be specially selected, whether for wild white clover or for perennial rye-grass, and should be as free as possible from undesirable plants.

Further, such seed production should be given particular care at harvesting, and should be regarded as of equal importance to the arable areas.

The question might then well be asked: If you insist upon the importance of home seed growing, and you admit that wild white clover seed and wild perennial rye-grass seed are in themselves such a great advance upon the ordinary white Dutch and the ordinary perennial rye-grass, why worry about plant breeding as far as these species are concerned?

The answer to this question is a general one, and applies to all species, whether at present they can be home-grown or not. The farmer when he sows a cereal crop, sows only one variety in any one area, or, in some cases he mixes two varieties or two species. In the former case he sows this particular variety because he considers it to be the one from which he may expect the best results. That is to say, the variety has an individuality which means something quite definite to him.

In the second case, he mixes his varieties or more often his species in such proportions as again to give him a certain definite result.

At present very few, if any, grass or clover strains have an individuality which is in any way as definite as that possessed by a cereal variety. Wild white clover is a mixture of types and so is wild perennial rye-grass. In spite of this (or, indeed, possibly because of it to some extent) they are greatly superior to their commercial counterparts, and are, therefore, to be recommended.

Yet the very fact that each consists of a number of types means that it presumably consists of both inferior and superior types, and that the elimination of the former might result in a definite improvement. The work of selection on the part of the plant breeder is then actually a process of sifting the material available, retaining only

what he considers to be the best types. From the best types he proceeds to build up strains, each with a definite individuality of its own exactly corresponding to say the varieties of oats, and, therefore, each with its own peculiarities and uses.

Even with oats, a farmer may use one variety because it is early and another because it is somewhat later on two different fields in order that he may be better able to distribute his labour at harvest time. No less can he, when he has strains of grasses with the same degree of individuality, sow them together to provide for both early and late grazing. That is to say, the production of definite strains should make each sowing of grass and clover seeds more definitely purposeful. It has already been suggested above that the great success of wild white clover and wild perennial rye-grass seed may possibly to some extent be due to the fact that they are really mixtures of different types. The improvement expected from plant breeding is, therefore, the elimination of the poorer types and the combination of a number of the better types in such a way as to give a definite result, which is even better than that obtainable from the original indefinite mixture.

The principle, of course, extends to other grasses and clovers. In all cases the development of distinctive strains each of which is in itself good opens up enormous possibilities in the direction of intelligent sward formation.

Another important aspect of herbage plant improvement thrusts itself upon us at this point. Supposing the plant breeder succeeds in isolating and developing such improved strains, each the equivalent of a variety in the case of cereals, how can they be kept pure and how can the pure strains be made available to the farmer?

With the cereals mainly grown in this country there is no real difficulty in this connection since each is normally self-pollinated, and there is little danger of natural crossing unless two varieties are actually mixed. Grasses, on the other hand, are normally wind-pollinated: within an area plants inter-cross freely. Clovers are insect-pollinated and again produce seed from inter-crossing. It is, therefore, obvious that in the case of grasses and clovers, if two strains of the same species are grown near each other much inter-crossing may occur and the individuality of each strain is lost even in the first generation. Moreover, since most of the species concerned are of very wide natural occurrence, there is always a danger of contamination from neighbouring fields and hedgerows.

This latter difficulty cannot be entirely overcome at once, except in so far as hedgerow grasses and clovers are not allowed to flower. The former difficulty must be solved by growing the different strains sufficiently far apart that cross-pollination may not occur.

For practical purposes, it is possible that provided a farmer wished to grow his own seed, the change of type that might occur through inter-crossing in one generation might not be sufficiently serious to make home seed growing impossible. Supposing, for instance, he wished to grow three strains of each of the species cocksfoot, perennial rye-grass and timothy for home seed production, then if definite plots of each strain were sown in such a way that the two strains of any one species were separated from each other by a plot of each of the other species no such serious contamination would occur that the seed in each case would not be mainly of the desired type. Such seed would, however, be unsafe for the formation of new seed production areas and it would be necessary again to return to the original source for stock seed.

It is probable, however, that the production of seed in the case of such strains would be more satisfactory in the hands of seed growing associations. Some such associations are, of course, already in existence but so far they are concerned with only one species. These might very well extend the scope of their activities with great advantage both to themselves and to the agricultural community, and there seems to exist no sufficient reason why a red clover growing association should not adopt and make itself responsible for the production of some one strain of each of the grasses. The principles involved would be exactly the same. At present, as far as that is possible, no strain other than, say, red clover strain "A" is grown in a particular district. This association might adopt strain "A" of each of the grass species, and in time the whole district would become saturated with these strains to the practical exclusion of all others. Similarly, another association might adopt strain "B" of each species and so on.

It is obvious that such a scheme would mean the definite organisation of seed growing, but this is exactly what is required. Of course, it is quite immaterial whether it be done by the farmers themselves in association with each other or whether it be done by a seed establishment so long as not more than one strain of any one species comes to be grown in any one district. Neither is it important who act as the seed distributors so long as the seed is distributed under adequate guarantees.

In all cases, more particularly in the earlier years, even if a particular strain is adopted by a certain district, owing to the obvious danger of contamination, stock seed from the original source should often be reverted to, and all seed should be marketed not only under the distinctive name of the strain, but it should also be stated how many generations have been grown so that an estimate of purity of strain may be made.

These, of course, are only provisional suggestions as to how the

new and improved strains might be made to reach the farmer, and what the rôle of the farmer himself might be in connection with the production of improved strains of herbage plants.

The whole thesis is that the plant breeder has quite definite ideas as to what should be the main points of the improved strains of herbage plants, and that with the material available he is confident that he can produce them, but on the other hand it will require the enthusiastic co-operation of farmers themselves in an organised form to secure that such strains should become generally available in such condition of purity and quantity as to effect a distinct improvement in our extensive grasslands.

EDUCATIONAL ACTIVITIES—WITH SPECIAL REFERENCE TO DAIRYING.

By J. HOLMES, B.Sc., N.D.D.

THE year 1929 will undoubtedly be a memorable one for the British Dairy Farmers' Association, marking as it does, fifty years of useful work and steady expansion. The Association has, from the outset, taken a keen and practical interest in all questions pertaining to dairy farming and milk production, hence the time is opportune for a short review of educational developments in dairying during the present century.

Dairying education will at once bring to the mind of many members the British Dairy Institute, which was opened by the Association at Aylesbury 40 years ago. This Institute—a pioneer effort—was destined to play an important part in the training of dairy teachers. A county school had been opened at Worleston, in Cheshire, a few years earlier, whilst others followed during the next ten years, although forming only one section of an agricultural college. The chief centres were Bangor, Reading, the Midland College, Hutton, Garforth and Kilmarnock, in Scotland, some of which have developed into important training centres for dairy students.

Their progress since 1900 has been slow but persistent, in spite of lack of funds and co-ordination in the earlier years. An increasing number of students have passed through these centres from year to year, and many now hold technical and administrative positions, whilst others have placed their technical knowledge to advantage in a business capacity.

In contrast with the provision of training at fixed dairy schools, reference should be made to the growth of peripatetic instruction in the earlier 'nineties. During this period, certain progressive county technical instruction committees appointed dairy instructors to visit various rural centres, organise classes in butter and cheesemaking and give lectures on subjects of interest to dairy students. By this means technical knowledge was made available to many who were unable to attend courses at the fixed training centres.

It is of interest to note that this section was indirectly supervised by the Board of Education, whereas colleges were partly dependent for supervision and funds on the Board of Agriculture. This position existed until 1912, when control passed entirely to the Board of Agriculture. In 1908 the Reay Committee reviewed the whole position of agricultural education and made several outstanding recommendations. A year later the Development Fund Act was passed, but

it was not until after 1912 that money from this source became available for the extensive development of the Farm Institute Scheme.

At this stage war intervened, checking the progress of many schemes. Several agricultural colleges were taken over for military purposes, and all county activities were concentrated on increasing the national food supply. In this connection the travelling butter and cheesemaking classes came into prominence, whilst many milk producing centres were developed, which previously had been considered too remote for distant trading. Another outcome of food control during this period was the official recognition of milk of varying standards; a step which marked the early stages of the graded milk movement.

The post-War period has seen a rapid increase in agricultural education facilities, thanks to increased national and county funds. The Development Fund has enabled many county farm institutes to be launched, and a dairy bacteriological service to be provided at the provincial centres. Colleges have expanded, county staffs have increased, and provision has been made for systematic research in dairying and allied subjects. Training at colleges and farm institutes has attracted a larger number of students than in pre-War days, due partly to greatly extended schemes of national and county scholarships, whilst work in the counties has developed rapidly; in short, this period has been one of development, co-ordination and consolidation.

GENERAL ORGANISATION—RESEARCH.

It must be abundantly evident that agricultural education has for its basis, sound practice and prolonged research, and it is on these two main factors that the present organisation is based. Take, for example, research. Until 1912 this country did not possess a research institute in dairying, although it is true some investigations had been carried out at such centres as Reading, the Midland College, and at Kilmarnock, in Scotland. The dependence of this country on foreign institutes for information on such essential factors as the butter-fat test, the scientific use of starters, and the systematic cropping of dairy farms, was slowly realised, and it was felt that an institute was essential. With the aid of exceptional private endowments and a grant from Government funds, the National Institute for Research in Dairying came into existence in 1912, and since then has been actively engaged in many of the problems connected with dairy farming and milk production. Although its activities were somewhat crippled during the War period, great progress has since been made, and it now possesses excellent laboratories and a large experimental farm with a new range of buildings. Much of this expansion is, undoubtedly, due to the untiring energy and enthusiasm of its director and his staff. The Institute has been mainly engaged in investigations concerning the production of clean milk and its distribution to the public. In addition, the problem of tuberculosis in dairy herds is receiving

attention, whilst several defects in cheese, condensed milk, cream and whey products have been successfully examined. It is perhaps worthy of note that the Institute has lost no time in publishing the results of their investigations so that they may be immediately available to the general dairying industry.

In Scotland and Ireland research has received some attention, but it has been concentrated to a great extent on cheese and butter. It is probable that in the near future research institutes will be established in both countries in order to continue and increase research on essential problems applicable to local dairying conditions.

EDUCATION.

Under the general scheme, facilities exist for higher dairying education at representative colleges throughout the country, the chief of which are Reading, the Midland and Kilmarnock. At such centres provision is made for courses extending over two or three years, which embrace a thorough training in the science and practice of dairy farming and general dairying, whilst a degree course of longer duration has now been provided at one centre. In this connection both the National Examination Board and the British Dairy Farmers' Association have awarded a certain number of diplomas yearly, and these have been regarded as suitable qualifications for dairy teachers throughout the country. An increasing number of these students now pass into the dairy industry or take up dairy farming on their own behalf.

Shorter courses ranging from a few months to a year are also conducted at these centres, and at most of the remaining colleges in this country. This type of course is also provided at many Farm Institutes. These institutes, controlled to a great extent by local committees, have distinctly local interests. The students are generally drawn from the county area and in many cases are assisted financially. Many members of the Association will be familiar with such names as Worleston, Hutton and Cannington, where a large number of students have been trained for service on milk producing and cheesemaking farms. It is undoubtedly true that these past students have formed the nucleus of the farm cheesemaking industry conducted on modern lines.

In recent years these institutes have paid greater attention to the actual methods of production, for the work at the Research Institute has served to demonstrate the importance of an initial milk supply which is beyond suspicion.

In the 1917 Journal of this Association, is a plea for the increased employment of women in dairying activities, and a somewhat caustic comment on the tendency for numbers to decrease. It must be gratifying, therefore, to see a decided increase during the last few years, and this has largely been due to greater care in milk production

on the farms. It is now realised that modern milk production requires exact knowledge of the underlying principles involved, and many dairy farmers, quite apart from members of the trade itself, recognise that women trained at the Farm Institutes and Colleges possess the necessary qualifications, together with a distinct keenness for farm dairying under reasonable working conditions.

For those who are unable to attend the Colleges or Farm Institutes an extended system of local instruction has been organised. Starting with a series of buttermaking and cheesemaking classes, the work has expanded, and now embraces such activities as milkers' competitions, farm demonstrations, and short courses in practical and theoretical dairying. These are directed by the Agricultural Organisers and carried out by special instructors, assisted to a greater or less extent by the Organiser himself. Figures in themselves are, perhaps, uninteresting, but the following tables will indicate in a concise manner the general extent of these activities in England and Wales.

TABLE I.

Comparative statement of instruction in Dairying provided by Local Education Authorities in England and Wales during the three years ended March 31st, 1927.

	1924-5.	1925-6.	1926-7.
(1) Total No. of instructors and instructresses employed (including those employed temporarily during the season)	69	72	77
(2) Travelling Dairy Schools :—			
No. of teachers employed ...	39	38	32
No. of students who received instruction	2,585	2,728	2,767
No. of farms visited	817	1,106	974
(3) No. of farmers who participated in Co-operative Cheesemaking schemes	18	42	51
(4) Farm Institute Courses—			
No. of courses	37	46	50
No. of students who received instruction	462	487	566
(5) Lectures and Demonstrations :—			
(a) Clean Milk Production :—			
No.	544	667	582
Attendance (approx.) ...	12,600	17,000	17,700
(b) General Dairying :—			
No.	198	290	405
Attendance (approx.) ...	6,300	10,000	16,000

TABLE II.

	Figures for 1926-27.	Figures for 1925-26.	Increase or Decrease
No. of students who received instruction at :—			
(a) Farm Institute Courses	566	487	+79
(b) Travelling Cheese Schools (includes 329 who attended Joint Cheese and Buttermaking schools) ...	766	710	+56
(c) Co-operative Cheese Schools ...	12	28	—16
(d) Travelling Buttermaking Schools (includes students at Joint Schools as above)... ..	2,001	2,018	—17
(e) Other Buttermaking classes ...	30	53	—23
(f) Various centres in milking (Clean milk)	843	542	+301
	4,218	3,838	+380

THE ADVISORY SERVICE.

The systematic courses referred to above mainly concern the younger generation, but it is evident that in order to gain full advantage of the results of research and modern practices an organisation must exist for passing on such information to those at present actively engaged in dairying. This work falls in the main on the advisory section of agricultural colleges and on the County Organiser and his staff.

The provincial colleges endeavour to demonstrate in a practical manner the general findings of research. Many of them possess an excellent dairy herd and a systematic cropping scheme suited to local practice—in effect the general aim at these centres is “Practice with Science.”

A natural extension of the work of the research institute has been the appointment at these centres of advisory dairy bacteriologists. This service is now becoming widely known to farmers, agricultural organisers and public health authorities. The work consists in the main of bacterial examination of milk samples in connection with County Clean Milk Competitions, examination of “random” samples from farms, dairies and dairy factories, and the general investigation of local problems in milk production. The advisers co-operate closely with the dairy staff of counties in their province and with the Research

Institute, and it is anticipated that valuable work will result as additional information becomes available throughout the country.

Recent years have been marked by sweeping changes in legislation affecting milk production. The Milk and Dairies Consolidation Act, the Milk and Dairies Order, 1926, the Preservatives Order and the Tuberculosis Order may be regarded as marking a new phase in milk production in this country. A brief study of many of the clauses in the 1926 Order will show how great has been the development in the methods of clean milk production; in fact, the whole Order is based on the findings of recent research in this and other countries. It is not surprising, therefore, that public health officials were only too willing to co-operate with the advisory service established at provincial centres. This co-operation has taken the practical form of short courses and conferences for sanitary inspectors, when an endeavour has been made to explain the general principles of research in recent years, and an opportunity given for a mutual exchange of views. In 1925, nine courses were held in England and Wales, with an attendance of 158 Inspectors, and in the following year 15 courses with 330 Inspectors were successfully organised. There is little doubt that these courses will have a far-reaching effect, and lead to a better general understanding of the problems of efficient milk production.

THE COUNTY STAFF.

Perhaps the strongest link in the advisory chain is the County Staff, for they are in close touch with local farm practices and are immediately responsible for local courses, lectures and other activities in each county. The general increase in dairy farming after the War caused considerable expansion in county activities and necessitated increase of staff in many cases.

With the exception of the chief cheesemaking counties, such as Cheshire and Somerset and a few counties in which farm butter-making persists, attention in recent years has been mainly diverted to methods of modern milk production based on the findings of the Research Institute. This movement received considerable impetus on the introduction of the Milk (Special Designations) Order, 1923, which consolidated several previous Orders officially recognising grades of milk. In addition, public attention was focussed on milk production to an unusual extent and many farmers realised that an efficient supply was a commercial asset. This county work involved an enormous number of advisory visits, demonstrations on farms and at Agricultural Shows, together with concentration on methods of milking. It was realised that too little attention had been given in the past to the handling of milk as a complete process; for instance, much milk was destined for second grade cheese and butter before entering the dairy, whilst much of the milk reaching the general public had been seriously

damaged owing to faulty practices in the cowshed, or by definite contamination in the dairy and on the streets.

This work has focussed attention on Clean Milk Competitions and Milkers' Competitions. Under these schemes it has been found possible to keep a number of dairy farms under voluntary control for several months in order that a definite and approved system may become a matter of routine. The work has been tested by taking periodical samples for examination at provincial centres and frequent advisory visits have been made by members of the county staffs. There is little doubt that the influence of these competitions has been felt far beyond the actual units involved, and farmers have testified to the increased efficiency of their workers and in many cases have obtained milk of far greater keeping quality. This general improvement in quality has often resulted in increased financial returns, particularly in the case of producer-retailers.

TABLE III.
GROWTH OF CLEAN MILK COMPETITIONS.

Year.	Competitors.	Counties.	Cows.
1920	Not recorded.	1	Not recorded.
1921	" "	2	" "
1922	" "	3	" "
1923-4	181	7	4,662
1924-5	563	24	15,467
1925-6	818	32	20,695
1926-7	1,062	38	28,520
1927-8	1,144	40	31,727

TABLE IV.
MILKERS' COMPETITIONS.

	1926-7.	1925-6.	Increase.
No. of Counties holding Competitions	19	14	5
No. of Competitions	43	31	12
No. of Competitors	828	416	412

Tables III and IV will give some indication of the extent of the Clean Milk Competition Movement, but it does not reveal the vast amount of advisory work attached to such competitions. Many of

the competitors have been induced to take out licences for graded milks and have continued to make use of the milk testing facilities at provincial centres.

Yet another outstanding activity has been the increased attention to the winter rationing of dairy cows. It has been realised for many years that during the winter months food is responsible for about 70 per cent. of the costs of milk production, hence any defects in feeding involved a serious loss. Many counties have organised a system of advisory rationing mainly through the local Milk Recording Societies, whilst fundamental research on rationing has been carried out at such centres as Cambridge and Reading. The movement received a great fillip owing to the outstanding activities of Mr. Boutflour when in Wiltshire. He succeeded in obtaining remarkable results and a strong following in the county. Many producers followed his system with success, whilst a far greater number were induced to consider and examine their methods of feeding.

These are only a few of the more prominent activities carried out in the majority of the counties in this country, and it should not be overlooked that advisory work, demonstrations and lectures at numerous local centres embrace not only general questions of milk production but also problems of breeding, stock improvement, milk recording, cropping, and treatment of dairy farm pastures. Attention has recently been given to the systematic treatment of grassland and to increasing production by the use of larger quantities of nitrogenous manures—a development which has great possibilities, but which will need close investigation for several years before general adoption can be safely recommended. In Scotland and Ireland activities of a similar nature have developed, but in the latter case attention has recently been concentrated on the commercial aspects of butter production rather than on questions of technique.

It has often been pointed out that agricultural education has done little to check the flow of rural youth to the towns. The Agricultural Organiser suffered, however, from the great handicap that he was unable to recruit members to his local courses until they had reached the age of 16, hence two years had elapsed from the time boys and girls left elementary schools until they were eligible for inclusion in agricultural educational schemes. This difficulty has now been remedied, and it is hoped that by encouraging an increased knowledge of agriculture and a love of nature many of the best rural children may be induced to take up a useful and interesting agricultural career rather than drift into occupations in the larger towns. In this connection, the Young Farmers' Club Movement has received considerable support and has served, and is serving, an excellent purpose. In the year 1924, 13 clubs existed with a membership of around 250, whilst in 1927, 85 clubs with a membership of over 2,000 were in existence, and many of them were interested in calves and milk production.

It is hoped that this outline of the present system will show that there exists in this country a scheme of agricultural education which meets the needs of the long and short course student and of dairy farming in general. The fees at agricultural colleges and institutes are reasonable, and where scholarships are obtainable under Ministry of Agriculture or county schemes, personal expenditure is practically negligible. In addition, members of the College and County Staffs are available to give reliable and unbiased information on problems of milk production.

THE ASSOCIATION AND EDUCATION.

It may be of interest to trace what part the British Dairy Farmers' Association has taken in the development of dairy education since its inception 50 years ago.

Early in the '80's pioneer members of the Association viewed with concern the lack of a central dairy school in this country, with the result that in 1887 first and second class diplomas were offered on an examination basis. In the following year the British Dairy Institute was opened at Aylesbury under the direction of Mr. John Benson, assisted in a minor capacity in those days by "Jim" who is probably known to nearly every member of the Association, and, happily, is still alive to tell the tale of the "piebald Pont l'Évêque." The Institute did excellent pioneer work and its early students formed the nucleus of the dairy teaching profession in future years, whilst others spread their influence throughout the Empire. In 1896 the Institute was moved to Reading and commenced an association with the College which has been of mutual advantage. With increased support the number of students has grown from year to year and successive expansions have been necessary.

The Dairy Show has always been strongly educational in nature, in fact it is still the Mecca of all interested in dairying and dairy farming. The special classes for students trained at Colleges, Farm Institutes, and local county centres, have served to give the general movement an impetus, whilst the general system of judging on score cards in many of the produce classes is distinctly educational in aspect. In addition, the medal scheme has supported educational activities enormously, whilst to compete in the Milkers' Competitions has always been the ultimate aim of the best milkers in each county competition. It is interesting to note that the development of clean milk competitions in recent years has been recognised by the Association in the award of a Challenge Cup and substantial money prizes to the counties showing the greatest educational activity in clean milk production.

Lastly, one might refer to the Annual Conferences organised by this Association. They are substantially educational in nature and have enabled members to study dairy farming and general dairying in

many of the chief dairying countries on the Continent. It is only a natural sequence, therefore, that the Association took an active part in organising the recent World's Dairy Congress in this country.

FUTURE PROGRESS.

It is hardly feasible that a scheme of agricultural education which has been built up in comparatively recent years should remain unchanged in the years to come; in fact, it would probably be fatal. What the exact tendencies will be is in the lap of the gods, but it may be useful to suggest certain lines which require further consideration and rationalisation.

There is little doubt that attention to clean milk production will continue; much has been done, but there are still a vast number of producers who have not been touched by the movement. Many of those who have adopted modern methods complain of a lack of appreciation on the part of the trade and the consuming public. Here, again, a vast field of expansion awaits educational activities, for there is little doubt that much of the progress can only be accomplished by educational methods. The food value of milk has been realised during recent years and every effort is being made to bring this knowledge to the public. It is, therefore, a matter of greatest moment that the milk supply in the near future should be above reproach, for it is a well-known commercial axiom that advertisement before the goods are "proof" will inevitably lead to condemnation. Co-ordination should be the key-note, and there are signs that both the trade and the public are slowly realising the potential value of a safe milk supply and the scientific aspects of the production and handling of so sensitive and concentrated a food.

There is every indication that women will play a greater part in milk production in the future. Recent researches have placed the work on a higher footing, and there is little doubt that women who have received a systematic training are capable of filling positions of trust in most of the departments of milk production and distribution.

It has often been suggested that too little attention has been paid to the training of factory assistants and managers, and it would seem that there is some justification for this complaint. Students who have attended the Colleges find it necessary to spend several additional years in subordinate positions before they are able to assume responsibility, and in cases where they have attempted to control factory undertakings disappointment has sometimes resulted. There is, however, every indication that students who possess a sound practical and scientific training are of distinct value in the larger dairies and factories, whilst the increase of laboratory facilities in the larger milk depôts is not without interest. On the products side much attention is being given to uniformity, grading and marketing, and herein lies

a vast field of work which will be intricate and exacting and will undoubtedly be based on educational propaganda. The Cheshire Cheese Federation has already been successfully launched, and from its inception has been closely associated with the County Farm Institute.

The general health of many dairy herds still leaves something to be desired, and here again co-ordination and increased veterinary facilities are inevitable developments of the future. Lastly, I would suggest that in spite of the development of the graded milk movement much greater attention should be given to the status and standing of ordinary milk. It would seem that no system of grading is complete which excludes ordinary commercial milk, and whatever system of treatment may be adopted in the larger dairies there is little doubt that the value of a clean initial supply will be realised more and more in future years. For this reason I venture to suggest that the time will come when a large proportion of milk destined for public consumption will be bought on a quality basis which will not only embrace a butter-fat content but also points for general bacterial cleanliness. This movement, together with increased attention to breeding, weeding, feeding and grading will result in greater all-round efficiency on the farm and a greater demand for dairy produce by the consuming public.

MENDELISM AND LETHAL FACTORS.

By PROF. R. C. PUNNETT, M.A., F.R.S.

THE Mendelian doctrine has now been before the world for over a quarter of a century. During that time it has been exhaustively tested out by scientific men all over the world, and to-day it is universally accepted as an essential part of the foundation of our knowledge of the living creature. For it has been found to hold good throughout the scale of life—from the lowly protozoans and mosses up to man himself. Nor has it remained in a purely theoretical stage. Long ago the plant breeder began to exploit the new knowledge and found in it such immense gain that experimental stations for the improvement of crops by working on Mendelian principles are now to be found in every civilised land. No practical plant breeder to-day would dream of setting about his task without a thorough knowledge of these principles. In the breeding of small live stock also the science of genetics, to give it its modern name, is beginning to make itself felt. Many poultry farmers are finding it of value in ridding their stock of undesirable features, while others are making profitable use of sex-linkage in breeding pullets for egg production. In the breeding of rabbits also, a rapidly rising industry, the new science of genetics is being found of great practical value in the purification of uniform strains for pelt production. One has only to look at the modern journals dealing with poultry and rabbits to realise that this science is proving itself of definite value to the practical man, and that the practical man is himself beginning to realise it. On the other hand, the breeder of the larger forms of stock undoubtedly shows less appreciation of the meaning of genetical science than the breeder of poultry or rabbits.

One reason for this probably lies in the high pitch of perfection to which modern breeds of cattle, sheep and horses have already been brought. With smaller stock crossing among different breeds has been freely practised in order to bring about improvement through the re-combination of qualities. Both poultry and rabbits readily lend themselves to such procedure, for with the large numbers that can be reared in a relatively short time, it is a fairly simple matter to found a new strain or breed upon a few desirable individuals which may have appeared as the result of crossing. And in purifying and fixing such a new breed a knowledge of Mendelian principles is of the greatest value in enabling the breeder to bring this about in the minimum of time. All crossing is a bit of a gamble, but with small stuff such as poultry or rabbits, the pecuniary loss is comparatively small if the cross fails to produce anything of value. With larger stock, however,

it is a different story. To begin with, the breeders of horses, cattle and sheep have been at their job far longer than the breeders of small stock, with the natural consequence that their material long ago reached a high state of perfection. After all there is a limit to what even the most skilful breeder can produce, and many an observer at the great shows must, like myself, have wondered whether this limit had not already been reached—whether the beast was not already as perfect as man's art could make him. The breeder may well ask why he should hazard such splendid material in experimental crosses. Apart from this, the amount of capital locked up in each individual beast would render such experimental work impossible without the resources of a millionaire. For an experiment in crossing, made with the idea of taking desirable qualities from two or more breeds and building them up into a fresh one, must be on an adequate scale or it is merely money thrown away. And if made on an adequate scale it would be costly. This must not be taken to imply that it would not be worth while. We know enough about heredity in these days to be confident that a million or two properly expended in such research would eventually make a return to the industry as a whole beside which the initial cost would appear trifling. As, however, there is little likelihood of research on this scale being started in the near future, it will be more profitable if we turn from speculating on what science *might* do for the industry to considering certain points in which it *can* already be of service.

It may be at once stated that very little progress has yet been made with the analysis of hereditary characters in cattle. It is true that the experienced breeder often has a pretty shrewd idea of what he will get when mating up his stock, but he himself will often be willing to confess that absolute certainty is out of the question. Surprises are apt to make their appearance, sometimes pleasant—more often the reverse. Yet it is at absolute certainty that scientific analysis aims. It wants to be in a position to say what is going to happen when two animals are crossed with the same certainty that the chemist can say what will result when two definite chemical re-agents are put together. The attainment of such certainty is possible, as indeed has often been demonstrated for plants and smaller animals. Even in cattle, where so little has been done in this direction, we have a few simple cases where certainty has been achieved, and before going on to discuss the main subject of this article it will be as well to consider one of these simple cases in some detail. For the notions of heredity that underlie it are those which apply to all living things; they are the notions by means of which the plant breeder to-day is making such enormous strides.

The case we shall choose is that of the two coat colours, red and black. Generally speaking, a herd of well-bred black (or black and white) cattle will breed pretty true, sometimes quite true to colour. But not infrequently red calves are thrown, and in spite of the fact

that they are promptly vealed, they may, nevertheless, go on turning up from time to time. The breeder generally puts them down to "reversion" or "atavism," or some such similar term invented by science in the days of her ignorance, and lets it go at that. He accepts the red calves as part of a scheme of things over which he has no control and continues to breed according to his usual practice. But while he was carrying along in his own way science was carrying along in hers. She began to realise that to call the red calf a "reversion" was only a confession of ignorance. It meant that the red colour had gone into the ancestry of black cattle at some time or other, and nothing more. The problem was what controlled its coming out—why it should appear in some herds and not in others? For with that knowledge we should be able to control its appearance, and, according as we wished, should be able to make it appear more frequently or prevent it from appearing altogether.

To-day we have that knowledge, and it is based upon direct breeding experience of thousands of instances similar to that of the black and red cattle. It depends upon the analysis of the various kinds of mating that may be made between the black and the red.* The facts are as follows:—

- (1) Red \times red gives only red.
- (2) Black \times red gives either (a) blacks only or (b) blacks and reds in approximately equal numbers.
- (3) Black \times black gives either (a) blacks only or (b) blacks and reds with a preponderance of blacks.

The results in (2) and (3) apply to individual matings only. In (3), for example, the same black bull would, with some black cows, give only blacks, and with others both blacks and reds: and in (2) a given black bull with any red cow would give *either* blacks only *or* both blacks and reds. It is important not to lose sight of the very obvious fact that the inheritance is alternative—that in every case the animal is either a black or a red, never a mixture of the two. Since blacks may give reds, while reds do not throw blacks, black is termed the *dominant* and red the *recessive* colour.

Now all these results can be explained on a very simple theory. As everybody knows, the formation of a new individual is due to the union of the germ cells—an egg-cell or ovum produced by the mother, and a sperm produced by the father. In respect of the alternative pair of characters, black and red, every germ cell is either a carrier of black or a carrier of red; that is to say, the germ cell carries a minute quantity of something that determines the development of black or of red in the individual which it helps to form. These somethings are called factors. Exactly what these factors are we do not yet

* A fuller account of this case, with illustrative diagrams, will be found under the title "Breeding Research with Animals," in the Journal of the Ministry of Agriculture, Apr., 1921 pp. 12-17.

know, but it is certain that they are perfectly definite, and follow a perfectly definite scheme in heredity. And that is enough for our present purpose.

In respect of the alternative pair of characters black and red, there are only two kinds of germ cells, viz.: red-carrying and black-carrying, and, consequently, there are only three possible ways in which germ cells can unite; for either

- (1) Red unites with red; or
- (2) Black unites with black; or
- (3) Black unites with red.

From union (1) a red animal must always be formed, and since such an animal cannot contain the factor for black it can form only red-carrying germ cells when it comes to maturity. In other words, red X red gives only red, no matter in what way the reds themselves were bred. Union (2) gives rise to a true breeding black; for since both of the germ cells from which it arose contained the factor for black all of the cells it forms are "black" and all of its germ cells are black-carrying. Union (3), where a "black" germ cell unites with a red one, also results in a black beast; for black is dominant to red in the cross. But such a black, though not visibly different from the true breeding black, is different in its breeding properties. It was formed from a "red" and a "black" germ cell, and when it comes to maturity and forms germ cells itself these are of the two kinds, red and black, and the two kinds are produced in equal numbers.

In dealing with the alternative pair of characters, red and black, we have to recognise that there are three kinds of animals, and only three, viz.:—

- (1) Reds, which always breed true to their recessive character.
- (2) Blacks which are pure for black, which breed true to black among themselves, and when crossed with red give only blacks. These are the pure dominants.
- (3) Blacks which carry the recessive red, and are therefore impure dominants producing equal numbers of black and red germ cells. Such animals crossed with red produce blacks and reds in equal numbers: bred together they produce blacks and reds in the ratio 3 : 1, and of the blacks made in this way, 1 out of 3 on the average is a pure dominant while the other two are impure dominants like the black parents.

Now we may return for a moment to our facts as set out on p. 38. Red X red gives only red and this is clearly as it should be on the theory. For the cross black X red there are two possibilities. There may result only blacks, or there may result blacks and reds in approximately equal numbers. The former case occurs only when a true breeding

black is used, *i.e.*, a black that has itself been formed by the union of two black germ cells and is, therefore, a pure dominant; the latter case occurs when the black used happens to be an impure dominant, *i.e.*, one that has resulted from the union of a black and a red germ cell. Lastly, for the cross black by black, there are also two possibilities. Blacks only may result, and this is because either one or both of the animals used is a pure dominant: or some reds may be thrown, and when this is the case it is because both of the parent blacks were impure dominants forming "red" germ cells as well as "black" ones.

Such is the explanation of a simple case of heredity where only one pair of alternative characters is concerned, and we may now turn for a moment to consider its practical bearings. We will assume that the owner of the black herd does not desire red calves, and his problem is how to ensure that they shall not make their appearance. The red calf never comes unless *both* of the black parents are impure dominants, and black herds in which they occur must be considered as containing both pure and impure dominants, the former being probably in considerable majority. So long as one of the parents is a pure dominant all of the calves must be black, no matter what the other parent may be. Hence to ensure the appearance of none but black calves in the herd it is sufficient to make certain that the bull used is a pure dominant. Now the distinction between the pure and the impure dominant is only possible through the breeding test. Put to red cows the pure dominant gives blacks only, while the impure dominant gives, on the average, equal numbers of blacks and reds. Before using a bull as a sire in his herd, the breeder should test him by mating him to a dozen or so red cows. If he gets none but black calves, it is practically certain that he is a pure dominant, and hence, will never sire a red calf when used in the herd. If, however, in this preliminary test he gets a red calf he must be regarded as an impure dominant, and when he is used on a black cow in the herd that also happens to be an impure dominant, a red calf is always apt to be dropped. By means of this preliminary test the breeder can make certain of getting none but black calves in his herd, no matter what may be the proportion of impure dominants among his cows. Moreover, if he uses only tested bulls for a few generations, he will practically eliminate the impure dominants among the cows in his herd, in this way also reducing the chances of a red calf even with an untested bull.

Another example of a similar type of heredity is that of the horned beasts which sometimes turn up in herds of polled cattle. Here the polled character is dominant to horned, and the method of ensuring the appearance of none but polled calves is like that for ensuring the appearance of blacks, *viz.*, to use only polled bulls that are pure dominants. A bull that has sired ten or a dozen polled calves when used on horned cows may safely be regarded as a pure dominant, and used in the herd without the likelihood of any horned progeny making their appearance.

The colour and horn cases have this in common—that they demonstrate how an unwanted recessive character may be checked from appearing in the herd and ultimately eliminated. The breeder may, however, quite well say that the occasional red or horned beast, as the case may be, which turns up is not a serious loss; that its elimination is not worth the trouble of testing his bulls. A red Friesian is as good a milker as a black, and the beef from a horned Angus is as good as that from a polled one. Nevertheless, it is worth the breeder's while to understand the method of ridding his herd of recessive characters, even if he does not propose to practise it in these cases. For the same principle applies to characters which are of undoubted economic importance, and in illustration, we may take a case recently made public by two distinguished Norwegian Scientists, Professor O. L. Mohr and Dr. Chr. Wriedt.* In September, 1927, they learned that in a well-known Swedish herd of Holstein-Friesians four peculiar hairless calves had been born. Except for the almost complete absence of hair these calves were normal in appearance, and were apparently born at full term. Though alive at birth they all died within a few minutes. Further enquiry showed that all of these four calves had been sired by the same herd bull, that the four cows used were all daughters of this same bull, and that these same four cows had previously each borne a normal calf to their father. All of these facts are in accordance with the theory that the hairless character is a simple Mendelian recessive to the normal, and that the hairless calves made their appearance because the sire and his four daughters, though apparently perfectly normal, were really impure dominants carrying the hairless character. Owing to the fact that the hairless calf is incapable of normal life, such a recessive character is called "*lethal*."

Had the case been one in which small stock, such as guinea-pigs or rabbits, were concerned the next step would have been to devise a series of simple experiments to test whether the hairless lethal always behaved as a simple recessive. Since in the present case this was not possible, Mohr and Wriedt followed the best course open to them. They instituted inquiries and got into touch with other herds in which the hairless calf had made its appearance. All such cases were found to fit in with the theory that hairlessness was a recessive lethal. Moreover, they were able to devise a further test from the data which they had collected. If an apparently normal bull carries a lethal as a simple recessive he is an impure dominant, and this means that of the germ cells which he produces half will carry the normal and half the lethal character. When he is used on a herd of pure dominant normal cows all of his offspring of both sexes will be normal in appearance, but half of them must be pure, and the other half impure dominants. Mating such an impure dominant bull back to his daughters means that he is being mated back to two distinct types of cow, viz.,

* See *Journal of Genetics*, xix, 1928, pp. 315-336.

pure and impure dominants, and these two types exist in approximately equal numbers. With his pure dominant daughters he will give offspring that are apparently all normal, though in reality half of them are impure dominants; with his impure dominant daughters he will give dominants and recessives in the ratio 3 : 1 according to the ordinary Mendelian scheme. In other words, when such a bull is mated back to a number of his daughters from pure dominant mothers the chance of a calf being born which is pure for the recessive lethal is 1 in 8. Mohr and Wriedt were able to collect 110 cases of father and daughter matings of bulls known to throw the hairless calf. Out of the 110, there were 98 normal calves and 12 hairless, a close approach to the 1 in 8 which the theory demands. There can be little doubt that this hairless lethal character behaves in heredity as a simple Mendelian recessive to normal, just in the way that red coat colour behaves as a simple recessive to black.

Curiously enough while collecting data on the hairless calves Mohr and Wriedt learned of another distinct case of abnormal calves being produced by this same breed of Holstein-Friesians. In these monstrous calves the greater part of the legs and of the jaws was undeveloped as though cut off, and for this reason the authors gave the name "amputated" to this particular form of monstrosity*. Like the hairless calves these amputated monsters were born at full term, but were either stillborn or died shortly after birth. Here, again, the evidence pointed to the abnormality being hereditary and transmitted in the ordinary Mendelian way. "Amputated," like "hairlessness," is a recessive lethal. As in the earlier case, so also in this one did Mohr and Wriedt collect the evidence of the father-daughter matings of bulls known from their performance to carry the lethal. In 115 such cases there were 102 normal and 13 amputated calves, *i.e.*, again almost exactly the expected proportion of 1 in 8 demanded by the theory.

These researches reveal what can only be regarded as a very serious position in many herds of Swedish Holstein-Friesians. No one will deny that the birth of such monstrous calves is a dead loss to the breeder, and while it is true that the proportion of such calves is yet small, it is also true that it must steadily increase unless the proper steps are taken to eliminate them.

Take, for instance, the case of a breeder whose herd is perfectly sound, but in his opinion requires the stimulating effect of a fresh strain of blood (as it is called). He buys a fine bull from a noted herd, and it would doubtless never occur to him to ask whether monstrous calves had ever made their appearance in the herd in question. Unknown to him the bull is really an impure dominant carrying a recessive lethal. He puts the bull to his cows with apparent good results; all the calves dropped are sound and of a rather better

* For a full illustrated account see *Journal of Genetics*, xx, 1928, pp. 187-215.

type. The introduction of fresh "blood" seems to be working well. Nevertheless, half of these improved beasts are really impure dominants carrying the recessive lethal. He selects the best of these young cows to go on building up his herd, putting them back to the purchased bull which has been such an apparent success. One or two drop a monstrous calf. Since the bulk of his breeding cows are still those of his original herd the proportion of monsters in the total of his calves will be quite small, and he will probably look upon their appearance as an inexplicable bit of bad luck. It is at this point that the breeder with an intelligent knowledge of Mendelism will at once be on his guard. But the ordinary breeder, with the proper scorn of "theory" as opposed to practice, noting the improvement of type effected by the purchased bull will persist with him as a sire. Each year may bring some improvement in the type of his herd, but each year a higher proportion of his cows will be impure dominants, and each year the proportion of monstrous calves will rise, until if he goes on persisting in this method of "improving" his herd he will find that eventually something like 10 per cent. of all the calves born will be monstrous. For something like half of his cows will come to be impure dominants, and the herd is now hopelessly contaminated by the lethal factor. However good the normal beasts might be it is unlikely that the herd would be able to carry this uneconomic dead weight of monstrosity, and though his stock might shine in the show ring the breeder who had mastered the elements of Mendelism would avoid them like poison. Lamentable as such a position is it can be remedied though the process is necessarily a slow one. Just as the red calf can be gradually eliminated from the black herd by always using a bull that is a pure dominant, so will the continual use of only pure dominant bulls gradually bring about the elimination of the recessive lethal. The difference in the two cases lies not in the method of procedure but in the manner in which the bull is tested. In the black-red case, as we have already seen, the bull can be most easily tested by direct matings with recessive red cows. But in the case where the recessive is a lethal this is obviously impossible. The only way to test the bull in such a case is to mate back with his daughters, when, as already pointed out on page 42, the bull carrying the lethal will give on the average one monstrous calf in eight. Mohr and Wriedt suggest that where lethals are about, no bull should be used for herd building that has not been proved, when so mated, to give at least 20 normal calves without a monster. It may be pointed out that if the cows used in the test are all known to be impure dominants, the expectation of monstrous calves is doubled, *i.e.*, is 1 in 4, instead of 1 in 8. Hence if the herd is a large one it would be worth while preserving such cows for bull-testing purposes, though of course their offspring should not be bred from.

In conclusion, a few words on the more general aspect of these cases. The breeder may say that all this has nothing to do with him.

No hairless or amputated monster has appeared in his herd, nor is he likely to be importing any Holstein-Friesians from Sweden; a state of affairs which fortunately is in all probability true. But if he thus easily dismisses these cases from his mind he will have missed the point of this article which is meant, not to tell him how to rid his herd of amputated or of hairless calves, but to put him on his guard against the insidious spread of lethal factors generally. Experiment has shown that lethals may be of many kinds, very varied in their nature and in the period of growth at which they operate. The two that have been discussed produce their fatal effect at birth, but there are others which result in death at an early embryonic stage. The barren cow may be the expression of such an early acting lethal, and, if so, the fault lies equally with the bull in spite of the fact that with other cows he may give a perfectly normal result. Should it turn out to be so the retention of such a bull is obviously a menace to the herd, for his continual use must inevitably increase the proportion of barren matings. Again, the appearance of weedy offspring may be due to a lethal whose action is less potent, to a semi- or partial lethal as it is sometimes called. However, the point need not now be pressed any further, for what has been written here will have served its purpose if it puts the breeder on his guard. Anything unusual in the reproduction of his herd, whether barrenness or the appearance of monsters or weaklings should be viewed with suspicion. The breeder should at once ask himself whether the facts can be construed as due to the operation of some insidious lethal that has made its way into his herd. And if such is the case he would be well advised to take drastic steps in order to eliminate it. The only way is to breed it out, and the only way to breed it out is in the light of Mendelian knowledge.

IMPROVEMENTS IN BREEDING.

By PROF. R. G. WHITE.

FROM the early dawn of civilisation the attention of man in all parts of the world has been largely fixed on the breeding of domesticated animals. It is safe to say that no generation has passed without attempts to improve them from the point of view of their service to the human race and to arrive at methods which would make the breeding of superior animals easier and less uncertain. As a result, our live stock has reached its present level; one or two general principles have been established and a great amount of tradition and theory has been accumulated.

As regards cattle, a notable advance was made in the 18th century, when Bakewell and his successors set up new standards and adopted methods which have since been followed to a greater or less extent. During the last hundred years there have been few matters which have received more attention and on which money has been poured out so lavishly as on the breeding of live stock. Even if we exclude the huge expenditure on the breeding of light horses, and concentrate attention on animals in which the ordinary farmer is more interested, it is almost staggering to think of the effort and expense devoted to this subject. There are in this country alone a score of Breed Societies for cattle, rather more for sheep, and a dozen or so for pigs; many of these have been in active operation for the last fifty years, some for much longer than that. Moreover, all our Agricultural Societies which organise shows, from the majestic "Royal" down to the smallest village show, make live stock quite the dominant feature of their exhibits, and claim that the improvement of live stock is one of the main reasons for their continued existence. Such a mass of organisation working with one great aim is altogether without parallel in agricultural life, and it might be expected that each generation of breeders would have both better stock and more reliable methods than their immediate predecessors. Is this the case? If we survey the whole field of Agriculture and compare the present position with that of 40 or 50 years ago, we find that farm machinery, the use of artificial manures and feeding stuffs, the growth of new crops, and greatly improved varieties of old crops have all developed at a rate which, to say the very least, is obvious to the most casual observer, but can we say as much for the breeding of our live stock, which has received so much more attention from organisations? It must be left to older people to compare the stock of the country with that of their earlier days, and it is perhaps hardly fair to expect an altogether unbiased verdict, but even allowing for the rose-tinted spectacles which time provides, and the number of "*Laudatores temporis acti*" in our midst, it is impossible

to produce any mass of opinion that there has been during the past half century any striking general improvement in the stock of the country, except in the case of the milk production of dairy cows. Even there a substantial discount must be deducted for the effect of improvements in methods of feeding and management. Moreover, the assertion may be made that if the ordinary commercial stock has not improved to any striking extent, there cannot have been any great improvement in the pedigree breeding stock. The numbers of animals entered in the books of our Breed Societies were never so great as during the last ten years, and as the majority of pedigree bulls, rams and boars find their way ultimately to ordinary farms, any marked advance in the merit of pedigree animals would have been reflected in commercial stocks.

If the above represents anything like a true state of affairs, and all this vast expenditure of time and energy has been made with little apparent result, it is surely not inopportune to begin an article such as this by considering the present position and examining the probable causes for the disproportionately small results from so much well-intentioned effort. Does it not seem possible that there is something fundamentally wrong with the direction of this effort? For the sake of simplicity we may perhaps concentrate attention first on the methods of the pedigree breeder. Generally speaking, he will, if questioned, say that "like produces like," and, therefore, his plan is to mate the best sire he can select or can afford to buy with the best females he can breed or secure. Add to this some belief in a certain amount of in-breeding, or the special value of certain lines of blood, and we have the basis of most of our practice in breeding farm stock.

Naturally, at this stage the question will be asked what prospect there is of any other method being discovered and, in particular, whether "science" can help? If science be interpreted as "exact knowledge," one answer, at any rate, is fairly obvious. A policy of mating the best with the best requires for its effective operation ability to ascertain exactly which is the best. There is no doubt that outstanding breeders owe their success first to their ability to form sound standards and to distinguish the best from the merely good, secondly, to their courage in ruthlessly discarding inferior animals or types. As regards the first and most important point, Great Britain can claim to have produced a good share of what may be termed "constructive judges," as the history of our breeds and stocks testify, but the time has surely come, when we cannot afford to rely on the production of such super-judges, whose skill and judgment, however great, dies with them. Industry no longer relies on the skill and judgment of the individual craftsman, but supplies him with machines capable of working with a precision which the human eye and hand cannot attain. We require something of the same exactness in our stock breeding if we are to make any notable advance. It is significant that the one

direction in which a notable advance has been made in recent years has been in milk production, and no one would deny that this advance is largely due to the substitution of milk recording for the less reliable method of judging by eye and hand.

In other classes of stock, if we except egg-production in poultry and the speed of race horses, we have nothing at all comparable. Would it not be possible for Breed Societies to collect from their members similar accurate information, which the next generation would be able to turn to good advantage? Similarly, could not Show Societies arrange to make better use of the wonderful exhibits of different breeds which are brought together each year? What, for instance, would it not be worth to have a mere record of the ages and weights of all the animals exhibited at Royal Shows during the last twenty years?

We cannot rely on future generations regularly throwing up supermen as stockbreeders any more than great inventive geniuses are produced frequently in any particular industry, but if we have facts and exact knowledge placed on record they can be applied by intelligent men, even if they have not got the superior intuitive skill of a Bakewell. A merely competent mechanic by the aid of a well-designed machine can produce results which surpass those of the most skilled craftsman working with primitive tools.

The first step towards placing stock breeding on a more scientific basis is the securing of exact information about the animals we already have. Our Milk Recording Schemes represent a good start, but much requires to be done before even milk recording can answer its full purpose. One fact which is being realised more and more is that the only sound test of the value of a sire is the character of his offspring. As time goes on it is certain that dairy sires, in particular, will be judged almost wholly by the milk records of their daughters. It is, therefore, important that not only good yields but also poor yields should be placed on record, and that information should be kept as to the conditions under which these records were obtained. Breed Societies issue circulars appealing to members to publish the yields of their good cows. Is it too much to hope that we shall soon have similar Associations *requiring* members to supply particulars of *all* yields (not necessarily for general circulation) so that other members of the same Society searching for a bull can get the fullest possible information regarding any particular animal? A certain amount of rivalry between different breeds is all to the good, but any Society which conceals unpleasant facts in order that its breed may show up well compared with other breeds probably does much more harm to its own members than to anyone else. In case it may be thought that this refers purely to unsatisfactory yields among dairy cows, other instances may be quoted. Red calves are occasionally born in herds of Black or Black and White cattle. Black lambs are occasionally born in white flocks, and so on.

How much disappointment and trouble would be saved if these facts were made known to others interested in the same breed, instead of being ignored or concealed. The people who would benefit most would be, not the supporters of other breeds, who probably have all their own particular "skeletons in the cupboard," but fellow members who would be able to trace the inheritance of the defects and eliminate them completely in a few generations.

The use to which the information already available can be put by methods of statistical analysis is even now becoming apparent, and in recent years a great deal of most valuable work has been done by scientists in many countries, with the object of enabling breeders to estimate more accurately than in the past the real capacity of their dairy cows. In particular, the work of Sanders at Cambridge, and the larger scale researches of Gowen in America must be mentioned.

As every breeder knows, a mere statement of the weight of milk produced by a cow in a lactation period or in a year is of very limited value. Apart altogether from the question of food and management during the lactation period, the condition of the cow at calving—the length of time she has been dry—age—the time of year at which she calves—the length of time between calving and service—all have an important influence on the records of that particular lactation, and unless all these are taken into account the weight of milk produced may give a very misleading idea of the cow's character as a milk producer. Some of the corrections for such factors worked out by Sanders may not be familiar to readers of this Journal, and with the permission of the publisher and Mr. Sanders they are given in a slightly condensed form below. The full tables are to be found in the Journal of Agricultural Science, Vol. XVIII, part 2.

VARIATIONS IN MILK YIELDS AND THEIR ELIMINATION.

Standardising Corrections.

1. Month of Calving.

Standard—Mean of all Months.					
Month of Calving.	Correction.	%	Month of Calving.	Correction.	%
January	— 0.9	July ...	...	+ 5.0
February	— 2.8	August ...	...	+ 3.0
March	— 0.2	September ...	...	+ 0.5
April	— 2.2	October ...	...	— 4.7
May	+ 3.4	November ...	...	— 2.6
June	+ 7.0	December ...	...	— 3.8

Thus if there are two cows similar in all respects except that one (J) calves in June, the other (O) in October, it is necessary to add 7% to the yield of the June calver and subtract 4.7% from that of the other to make a fair comparison: *e.g.*, if J gave 7,800 lb. of milk and O 8,400 lb. of milk, the record of J would be regarded as the better. Her standard yield is $7,800 + 7\%$ of 7,800 = 8,346 lb., while the standard yield of O is $8,400 - 4.7\%$ of 8,400 = 8,005 lb.

2. Length of Service Period—i.e., the period from calving to the date of effective service. Standard—S.P. = 85 days.

Correction.

S.P. in days.	1st Calvers.		Others.
	%		%
0- 19	+ 28.2	+ 33.9	
20- 39	+ 18.4	+ 21.3	
40- 59	+ 10.6	+ 11.9	
60- 79	+ 4.2	+ 4.6	
80- 99	- 1.1	- 1.1	
100-119	- 5.5	- 5.9	
120-139	- 9.2	- 9.7	
140-159	- 12.4	- 12.9	
160-179	- 15.2	- 15.5	
180-199	- 17.6	- 17.8	
200-219	- 19.7	- 19.7	
220-239	- 21.5	- 21.4	
240-259	- 23.1	- 22.8	

Thus a record of 1,000 gallons from a cow which has either not been served or has failed to hold until 30 weeks after calving is no better than one of 800 gallons from a cow served at the standard period about 12 weeks.

3. Age of the Cow. Standard—Maturity = 6th lactation.

Age.	Correction.	Age.	Correction.
	%		%
1st lactation	+ 30.6	7th lactation	+ 1.4
2nd „	+ 18.0	8th „	+ 4.8
3rd „	+ 9.3	9th „	+ 10.4
4th „	+ 3.7	10th „	+ 18.5
5th „	+ 0.7	11th „	+ 29.4
6th „	—	12th „	+ 43.7

4. Length of the Dry Period. Standard—D.P. = 40 days.

Correction

D.P. in days.	2nd Calvers.		Others.
	%		%
0- 9	+ 25.1	+ 14.0	
10- 19	+ 15.2	+ 8.8	
20- 29	+ 8.0	+ 4.7	
30- 39	+ 2.8	+ 1.5	
40- 49	- 1.3	- 1.2	
50- 59	- 4.4	- 3.3	
60- 69	- 6.4	- 5.0	
70- 79	- 8.8	- 6.5	
80- 89	- 10.4	- 7.6	
90- 99	- 11.7	- 8.6	
100-109	- 12.7	- 9.4	
110-119	- 13.5	- 10.1	
120 and over	- 14.8	- 11.7	

INHERITANCE OF MILKING CAPACITY.

The work of Gowen and others in America is based on a larger number of records than any corresponding number investigated in this country, and is, therefore, capable of more detailed analysis. In addition to finding the correlation between production and the various conditions of age, lactation, conformation, &c., Gowen* has worked out the correlation between the milk yields and butter-fat production of a particular cow and those of her ancestors. A few of the results may be summarised in the following table:—

Correlation of Pro- duction of cow with—	Milk yield.	Butter-fat.
Dam ...	$\cdot 381 \pm \cdot 033$	$\cdot 221 \pm \cdot 036$
Sire ...	$\cdot 362 \pm \cdot 015$	$\cdot 374 \pm \cdot 015$
Sire's Dam ...	$\cdot 297 \pm \cdot 014$	$\cdot 336 \pm \cdot 014$
Sire's sire ...	$\cdot 070 \pm \cdot 014$	$\cdot 176 \pm \cdot 014$
Dam's dam ...	$\cdot 344 \pm \cdot 021$	$\cdot 258 \pm \cdot 022$
Dam's sire ...	$\cdot 244 \pm \cdot 016$	$\cdot 224 \pm \cdot 016$

The striking feature of this table is the fact that while the production of a cow is strongly influenced by both parents and three of the grandparents (the fourth grandparent, the sire's sire, has apparently no influence at all).

A recent suggestion, largely based on the above figures, provides an excellent illustration of the way in which real advance can be made when sufficient facts and information have been collected and properly studied. A. D. Buchanan Smith, whose attention was called to the matter by the examination of Jersey records, and the practice of one or two breeders, has suggested in a paper read at the Glasgow meeting of the British Association, that Gowen's figures fit in very well with the correlation which would exist if some of the factors responsible for the milk production were sex-linked. In an article such as this it is impossible to explain the generally accepted theory regarding the inheritance of sex or the significance of linkage. It, perhaps, is sufficient to explain the practical results, which in the case of mammals† may be summarised as follows:—

1. So far as sex-linked characters are concerned, the sire can pass on to his daughters characters which he cannot transmit to his sons.

2. While the sire is homozygous for sex-linked characters, the dam may be heterozygous, *i.e.*, she may transmit characters which she herself does not display. Assuming that Smith's theory is proved to be correct, and that at any rate some of the factors responsible for

*J. W. Gowen. Milk Secretion. *Williams and Wilkins.*

†As the term "sex-linkage" is perhaps best known in the poultry world, where it is valuable as a means of distinguishing the sex of chickens at a very early stage, it may, perhaps, be mentioned that the part played by the two sexes is different in mammals and birds, and in poultry it is the hen that cannot pass on to her daughters characters that she can transmit to her sons.

milk production are sex-linked, the practical outcome may be summarised in this way. A bull, so far as these characters are concerned, will carry factors for a certain level of production of milk and butter-fat. He can transmit only these factors to his offspring. On the other hand, the cow, herself a producer at a certain level, may transmit factors leading to production at a different level in her offspring.

3. The production of a cow is not influenced at all by the character of her sire's sire. The table on page 50 shows that Gowen found practically no correlation between the dam and her paternal grand-sire, and this is the most important fact which Smith has so far obtained in support of his theory.

It must again be emphasised that the above conclusions only apply to sex-linked characters, and must not be applied to other points or qualities of any class of animal.

The importance of the theory regarding the sex-linkage of characters responsible for milk production is obvious. If found to be correct it follows that in the selection of a sire for a dairy herd no particular importance should be attached to the merit of his sire as a producer of dairy animals. Moreover, it greatly simplifies the examination of the various records in an animal's pedigree to know that the bull could not have transmitted factors for two different levels of production, so that the true value of a sire can be the more accurately assessed. But, perhaps, the use to which such a theory will be most generally put will be in the breeding of dual-purpose animals. With the British fondness for compromise we have in this country developed breeds which, while not capable of the highest degree of excellence either as beef or milk producers, combine the two qualities fairly well. In some of these, notably in the Dairy Shorthorn, there is a tendency to swing first to the one extreme and then to the other to secure animals which will be about the happy mean. In order to infuse greater substance and flesh-carrying capacity into strains of high-yielding cows which have become rather defective from the butcher's point of view, a dash of Scotch or beef Shorthorn blood is frequently introduced. If the theory of sex-linkage is substantiated, it is obvious that the best way of doing this is to use a bull sired by a beef bull out of a really good dairy cow. It will be remembered that many successful sires of Dairy Shorthorn cows have been bred in this way. On the other hand, an indiscriminate infusion of beef blood has in other cases done immense harm, and on the theory outlined above it is obvious that if either parent or any of the three grandparents other than the sire's sire is of a non-milking strain, the milking character of the resultant cow is likely to be seriously affected.

While speaking of dual-purpose cattle it is necessary to refer to an idea which has received support in some quarters. Wilson*, in particular, has attempted to show that in some breeds, at any rate, sires may be

*James Wilson. *The Inheritance of Milk Yield in Cattle*, Scientific Proceedings, Royal Dublin Society, Vol. XIII.

fairly definitely grouped into three classes, (1) those whose daughters are all low producers, (2) those whose daughters are all high producers, and (3) those whose daughters may be either low, medium or high producers. From this, the conclusion is drawn that the sort of intermediate production which we associate with dual-purpose characters is the expression of a kind of hybrid condition between high and low producing types, and it is suggested that production at this level cannot be fixed any more than, say, the roan colour of the Shorthorn. The evidence in support of this theory is, however, not convincing, and on general grounds there would seem to be no particular reason why an intermediate type of production should not be capable of breeding true just as easily as any other types, provided that proper attempts were made to secure pure strains. Although, as shown above, many breeders of dairy type do pursue a policy which would be necessary were Wilson's suggestion proved, doubt may be expressed as to whether they are wise in swinging first to one extreme and then to the other. It is quite certain that a yield of 700 or 800 gallons of milk a year is not incompatible with a good frame and fair flesh-carrying capacity. This is the type that the majority of breeders desire. Would it not be wiser to "go for" it in the straightforward way of selecting animals of that type, taking care in the selection of the bull to use the character of his daughters as the criterion?

When Mendel's work was rediscovered at the beginning of the present century it was at once hailed as likely to be the means of revolutionising both plant and animal breeding, and it is now both instructive and humiliating to read some of the predictions which were then made. Although the science of Genetics has grown at an enormous rate and has now a most formidable literature of its own, it cannot be said that up to the present any great advance in the breeding of farm stock has been brought about as the result of the application of Mendel's law. This is not because Mendel's principles have been found unsound or that they have been found inapplicable to farm animals, but because of the practical difficulties in the way of applying them to expensive slow-breeding animals. Theoretically, the process is simple and easy. The various factors responsible for the animal's make-up have to be determined by suitable breeding experiments. When they are known and their relationship understood, it should be possible to combine any desired characters and to make up an animal of a desired specification. In practice, the difficulties appear at present well-nigh insuperable, and it must be confessed that up to the present the effect of Mendel's work and the research which has arisen out of it has been mainly indirect. Even so, it must not be minimised. It enables the scientist to account for well-known facts which had previously troubled generations of the most skilful breeders and to solve certain of their problems.

As an indication of the minor difficulties which may be overcome by an understanding of even the more elementary principles of

Genetics, the eradication of undesirable colours may be mentioned. A more important matter is the case of the bull-dog calf in Dexter cattle, which has been fully worked out by Dr. Crew at Edinburgh. It has been shown that this—like other lethal and sub-lethal characters—is due to a recessive character, with the implication that where a deformed calf is produced both parents carry the special factor responsible. If, for instance, the bull is free from it, then his calves will all be apparently normal whether the cows carry the factor or not (just as a “pure-breeding” black bull mated to red cows will produce nothing but black calves). It is easy to test whether the bull carries the recessive factor or not by mating him to a few cows which have produced deformed calves. If even one of his offspring is deformed, then he should be discarded. If trial in this way is made with successive numbers of bulls, the character will in a few generations be reduced to quite negligible proportions, even though no attempt is made to select the dams. The occurrence of such undesirable characters is apparently more common than is generally known. Recently, Norwegian writers have advocated that a bull should not be considered eligible for a Government premium until he had sired calves from at least 20 of his own daughters. This, obviously, would enable any hidden defect due to recessive factors to be revealed. Incidentally, such a proposal indicates how far we are behind other countries in the selection of dairy sires. The idea that a bull should be judged for premiums on the production of his daughters, that is not until he is about five years old, would be regarded in many quarters as revolutionary. The Norwegian proposal referred to would involve the withholding of premiums until the bull was at least seven years old.

Recent work in Genetics has done much to clear up the long debated question of in-breeding. It has shown that in-breeding in itself is not necessarily either bad or good. The effect of in-breeding is to sort out pure-breeding lines of animals, and the results will depend first of all on the constitution of the original stock, and secondly on the skill shown in selecting from the pure lines. If the original stock contains many defects, the results of in-breeding will be disastrous. If, on the other hand, the original stock contains few hidden defects, by skilful selection these can soon be weeded out, and the lines that remain will be both superior in most directions to the original stock, and will breed much more true to type. Experiments which have been carried out with rats are often quoted. Starting some years ago a number of lines were selected and bred continuously by brother to sister matings. In this way ever-increasing numbers of lines were produced, and it was found that some of these lost vigour or became sterile and so died out. Others, on the other hand, were larger, more vigorous, matured more quickly and had larger litters than the original stock. Up to the present time, some of these lines have reached seventy generations of brother to sister matings. There can be little doubt

but that similar results would be obtained with larger animals if similar trials were made with them.

In conclusion, while it may be claimed that the science of Genetics has not yet much in the way of practical advice to give to the breeder, it does give a feeling that our feet are on firm ground, and enables us to conduct our breeding experiments with more confidence and hope. When one remembers that the science of Genetics has barely attained its majority, while stock breeding has engaged the most careful attention of successive generations of breeders throughout the world for thousands of years, it is amazing to think how rapidly the scientist is gaining on the practical man, and how already he can offer practical suggestions as to policy, which the wise practical breeder will do well to take into account.

RECENT DEVELOPMENTS IN THE FEEDING OF MILCH COWS.

By PROFESSOR T. B. WOOD, C.B.E., F.R.S.

MODERN methods of feeding dairy cows are all based on a paper by Kellner published in 1911. The paper, which was published in the Report of the Fifth International Congress for Milk Production, describes a complete balance experiment with three cows, and gives figures for the consumption of nitrogen, carbon and energy by the cows, for their output of dung, urine and marsh gas, and for their yield of milk. From these figures Kellner was able to compute that each of the three cows used in the neighbourhood of 2 lb. of starch equivalent in the production of 1 gallon of milk. Subsequent, but less complete observations by Jordan, by Eckles and by Möllgard and Andersen, confirm this figure, as does also the work carried out in Denmark and the Scandinavian countries where rations are computed in food units.

It is important to realise that the acceptance of the point of view indicated by such a figure implied a radical change in the method of computing milk rations. It had been customary to compute for a dairy cow what was known as a balanced ration, that is to say, a ration supplying per cow, per day, certain quantities of protein and of energy containing materials, carbo-hydrates and fats. As soon as it was accepted that each gallon of milk required for its production a certain definite quantity of nutrients, the ordinary conception of a balanced ration had to go. It became necessary to recognise that the ration for a cow in milk must be regarded as consisting of two parts, one for maintenance which must be computed according to live weight, the other for milk production which must be computed according to milk yield.

This was clearly recognised by Mackintosh of Reading, Garrod of Kent, Jesse of East Sussex, Boutflour of Wiltshire, and many others who have assisted to spread it throughout the country by their milk rationing schemes carried out side by side with milk recording. It was given official sanction recently by the publication of the Report of the Cow Rationing Committee of the Ministry of Agriculture.

According to this pamphlet, which contains much useful information, the food requirements of a gallon of average milk are, $2\frac{1}{2}$ lb. of starch equivalent and .6 lb. of digestible protein. It will be noticed that this figure is considerably higher than the original figure

indicated by Kellner's experiment. Personally, I consider $2\frac{1}{4}$ lb. a maximum figure for normal milk containing 3.7 per cent. of butter-fat. I am supported in my opinion by the fact that deep milking cows, given a concentrated production ration supplying $2\frac{1}{2}$ lb. of starch equivalent per gallon, admittedly require very little coarse fodder for maintenance. In my opinion each gallon's allowance supplies an excess of at least $\frac{1}{4}$ lb. of starch equivalent, and in a deep milker this excess provides a large part of the maintenance requirement.

The question could be finally settled by any careful observer, who had command of a number of cows, if he recorded ;

- (1) live weight of each cow every week.
- (2) food consumption of each cow.
- (3) milk yield of each cow.

The method of working out the best value for the starch equivalent requirement per gallon from these figures is given in a paper which I have recently published. (*Journ. of Agric. Science*. XVIII. 486). I will collaborate with pleasure with anyone who will supply the experimental figures for at least 50 to 100 cows, making myself responsible for the somewhat lengthy and complicated calculations.

Meantime, the wide adoption of the above described method of computing rations has brought into prominence another important point, namely the cow's appetite or capacity for food. The question of the quantity of nutritive material, measured as starch equivalent, which an animal could eat per day was, I believe, first raised for discussion in a paper by my late colleague (the late K. J. J. Mackenzie) and myself at the British Association at Newcastle-on-Tyne in 1916. The general realisation of its importance in feeding milch cows, and especially deep milkers, is due to the picturesque eloquence of Mr. R. Boutflour, Dairy Commissioner of the Ministry of Agriculture.

How this question enters into the composition of rations is shown by the following table. Suppose, for the sake of argument, that the appetite or capacity for food per day of an average milch cow is 33 lb. of food, weighed dry, and that her maintenance requirement is 7 lb. of starch equivalent per day. Then her ration per day in lb. of starch equivalent will be :—

Milk yield.				lb. S.E.	
1	gallon	...	...	$7 + 2\frac{1}{2}$	$= 9\frac{1}{2}$
2	gallons	...	...	$7 + 5$	$= 12$
3	"	...	...	$7 + 7\frac{1}{2}$	$= 14\frac{1}{2}$
4	"	...	...	$7 + 10$	$= 17$
5	"	...	...	$7 + 12\frac{1}{2}$	$= 19\frac{1}{2}$
6	"	...	...	$7 + 15$	$= 22$
7	"	...	...	$7 + 17\frac{1}{2}$	$= 24\frac{1}{2}$

If her total consumption is 33 lb. of food per day, weighed dry, in each case, it is easy to calculate the percentage of starch equivalent which her total ration must contain if it is to supply her with the weight of starch equivalent required in each case, for maintenance plus milk production. The figures are given below :—

Milk yield.				Percentage starch equivalent in ration.		
1 gallon	29
2 gallons	37
3 "	44
4 "	52
5 "	60
6 "	67
7 "	74

Good hay contains about 40 per cent of starch equivalent. Clearly, a cow can yield between 2 and 3 gallons per day on a diet of good hay only. A cow yielding 7 gallons per day must be fed on concentrates alone with little or no bulky food or she cannot find room for enough food to meet her total requirements. In my experience, however, deep milkers like other good doers have abnormally large appetites which somewhat modifies these conclusions. For instance, if a 7-gallon cow can eat as much as 35 lb. of food per day, weighed dry, her ration need not contain more than 70 of starch equivalent.

Another point which has been demonstrated is that a cow requires more food to make a gallon of rich milk than she does for a gallon of poor or average milk. Thus, if the allowance of starch equivalent is $2\frac{1}{2}$ lb. per gallon of average milk containing 3.7 per cent of butter-fat, it must be raised to 3 lb. per gallon for milk containing 5 per cent of butter-fat and it may be lowered to 2 lb. per gallon for milk containing only 3 per cent of butter-fat.

Normal average milk contains approximately 4 per cent of protein, which corresponds to .4 lb. per gallon. If, therefore, the proteins of milk and the proteins contained in a cow's ration were exactly the same, .4 lb. of protein in the ration might suffice to produce 1 gallon of milk. Unfortunately, this is not the case. The proteins contained in cattle foods are by no means of the same composition as the proteins of milk. There is, therefore, a considerable and very variable loss in the conversion of food protein into milk protein. By very careful and prolonged experimentation it might be possible to find out with some degree of exactitude how much protein in one particular ration was required to make the milk protein in 1 gallon of milk of known composition. Such precise information would not, however, be of any very definite practical value for several reasons. Firstly, because milk varies considerably in protein content, and secondly, because in practice the composition of rations vary in accordance with the supply of home

grown food and the market prices of purchased foods. The only practical course is to adopt a figure high enough to be safe, however the composition of the ration is varied. It was in this way that the accepted figure of .6 lb. of digestible protein per gallon was arrived at, and even this figure is not invariably safe. The protein of certain feeding stuffs, for instance, differs so very widely from milk protein, that if by chance a ration should be composed entirely of such feeding stuffs, an allowance of .6 lb. of digestible protein per gallon might not suffice to make all the milk protein required to maintain the cow's maximum yield. In such an exceptional case the cow would either rob her muscles and so lose flesh or her milk yield would fall. Such cases are very exceptional. The best way to avoid them is to use a ration containing a varied assortment of feeding stuffs so that the total protein of the ration is likely to be of about average composition.

Average normal milk contains .75 per cent. of ash which is, in the main, calcium phosphate. This corresponds to about $1\frac{1}{4}$ oz. of calcium phosphate per gallon. Animals do not digest and absorb much more than about half the ash constituents they eat. A cow must, therefore, eat something like 2 oz. of calcium phosphate for each gallon of milk she yields. A very heavy milker may at this rate require as much as 1 lb. of calcium phosphate per day.

Calcium phosphate is contained in the ash of all plants. A cow will, therefore, eat a considerable amount of this substance in any ration which she may be given. The work of Orr and his colleagues at the Rowett Institute at Aberdeen, has shown that the amount of calcium phosphate and, indeed, of other mineral constituents contained in ordinary feeding stuffs may not in some cases be sufficient for the needs of heavy milking cows. The subject is new and its study involves complicated and prolonged investigation. Consequently, the results up to the present are not much more than suggestive, and some time must pass before they can be translated into definite prescriptions. In the meantime, owners of deep milkers should try the effect of adding a few ounces of some safe brand of steamed bone flour or bone ash as a source of calcium phosphate to the daily ration of some of their cows. And it is also desirable to give the cows access to a lump of rock salt as a source of sodium and chlorine.

So far the discussion has concerned itself almost exclusively with the part of the ration designed to supply the material for production. But a word should be said about the maintenance ration. As long as an animal is alive its organs must carry out their functions. The heart must beat, the lungs must expand and contract, and so on. These all involve muscular movements, and muscular movements can only be made at the expense of the oxidation of something in the body which provides the motive power. These movements go on as long as the animal lives, even when it is asleep. To provide motive power for them

an animal oxidizes and uses up per day between 1 and $1\frac{1}{2}$ ozs. of starch equivalent for every square foot of skin surface in its body. The skin surface of an average sized cow measures somewhere about 50 sq. ft. Her circulation and breathing, therefore, use up per day between 50 and $62\frac{1}{2}$ ozs. of starch equivalent or, say, about $3\frac{3}{4}$ lb. This figure, which is known by physiologists as the cow's basal metabolism, has been measured with considerable accuracy. There are, however, certain other movements associated with normal healthy life. The cow must lie down and get up. She must move in search of food and for other purposes. There are voluntary movements made in response to hunger and outside sensations. Consequently, they will vary from day to day in accordance with the cow's surroundings. If food is supplied and her surroundings are comfortable, the cow will not move very much. If she has to search for food in a poor pasture, if her bedding is wet, if she is in a draughty shed, or if she is worried by flies she will move much more. All such movements use up food for motive power. On the average the food used for such movements may be put at somewhere about 2 to $2\frac{1}{2}$ lb. of starch equivalent per day, but there are no accurate measurements at present available, and this figure is only an intelligent guess.

Now, the food used for basal metabolism, $3\frac{3}{4}$ lb. S.E. per day, plus the food used for normal movements, say $2\frac{1}{2}$ lb. S.E. per day, together make the maintenance requirement of about 6 lb. S.E. per day, and on this ration a normal dry cow under normal conditions should just maintain her live weight without gain or loss. Hence the term maintenance ration or requirement.

The purpose of this rather theoretical explanation of the maintenance ration is to show that it contains a very uncertain and variable allowance for voluntary muscular movements, and that in consequence the maintenance ration itself is a somewhat uncertain figure. The accepted figures which increase with the size of the cow from 5 to $7\frac{1}{2}$ lb. S.E. per day, are probably quite accurate for cows kept under very good conditions, but far too low for cows searching for food on poor pasture and for cows kept under any kind of conditions which make them fidgety and restless. This should be the scientific basis of good cow management, and the same idea applies equally to other animals. A comfortable animal is restful. An uncomfortable animal is restless. Restlessness may easily use up an extra pound of starch equivalent per day, which costs about $1\frac{1}{2}$ d., and increases quite appreciably the cost of milk production.

On the practical side, Boutflour has stressed several very useful points. He suggests that in the case of the deeper milkers, the allowance of concentrates based on their milk yield should be fed first, part of it in the morning and part at night, and that after this is cleared up, they should be given their maintenance allowance of coarse

fodder, hay or whatever it may be. He insists that this should be given long and not chaffed, because they can pick out the leafy, more palatable and digestible parts from long fodder and reject the indigestible stemmy parts. The meaning of these suggestions is that a cow's, or any other animal's, digestive organs can only deal effectively with a certain amount of food per day. If the coarse fodder is withheld until after the concentrates are cleared up, the coarse fodder is not so attractive that the animals will eat more than their digestive organs can deal with effectively. Thus their total consumption is limited to their real requirements. If, on the other hand, the animals are allowed to fill themselves with coarse fodder while they are hungry and then given their concentrates, which are of course more attractive and palatable than coarse fodder, they may be induced to eat more than their digestive organs can deal with effectively. This seems good reasoning, and according to Boutflour the results obtained in practice are excellent. Another suggestion which comes from the same source is that dry cows should be gradually got on to a production ration a month or so before they are due to calve, and that throughout the earlier stages of lactation the feeding should be kept somewhat in advance of the milk yield until further advance of the production ration lacks response in yield of milk. Many practical men would hesitate to adopt a high ration before calving for fear of milk fever, which was supposed to be caused by too high condition at calving time. Milk fever is, however, not the serious disease it was before the advent of modern methods of treatment. N. C. Wright of Reading has produced some evidence that its real cause is deficiency of calcium in the blood. He is continuing his work on this important subject at the Scottish Dairy Research Station. If he gets further confirmatory results it may be that high feeding, if the ration supplies abundance of calcium, will turn out to be a preventive of milk fever.

Golding of Reading, working in collaboration with the Lister Institute, has shown that the milk of cows in the winter may be deficient in vitamins, which detracts from its value for consumption by human beings, more especially infants, and for young animals. He has further shown that this deficiency of vitamins may be prevented by including a small quantity of cod liver oil in the cow's rations. A Cambridge suggestion may possibly provide a preferable alternative to cod liver oil. This suggestion will be dealt with more fully later.

The calculation of the amount and kind of concentrated food required to maintain the yield of milk of cows in pasture has long been a vexed question. The practice of giving a pound or two of common cotton cake to correct the scouring on bush pasture in Spring and Autumn has long been in vogue, but this is by no means the whole story of milk rations for cows on grass.

The last few years have seen a very great advance in this subject. Woodman, and his colleagues at Cambridge, have shown that young

pasture grass as grazed by animals on well managed pasture contains in its dry matter at least 20 per cent of digestible protein and at least 65 per cent. of starch equivalent, and these figures seem to be independent of the type of pasture and of the period of the year. Accepting these figures, it appears that a cow which can eat and digest 35 lb. of dry matter per day, will consume on well managed pasture $22\frac{3}{4}$ lb. of starch equivalent including 7 lb. of digestible protein. Of these amounts the cow will require, say, 7 lb. of starch equivalent and $\frac{3}{4}$ lb. of digestible protein for maintenance, leaving for production $15\frac{3}{4}$ lb. of starch equivalent and $6\frac{1}{4}$ lb. of digestible protein. Production in the case of a cow at grass includes not only milk production but the effort of walking twice a day between field and milking shed, and the further effort of walking about to graze. Attempts have been made at Cambridge during the last two years to determine the weight of starch equivalent required to provide the motive power for this walking, but up to the present with very little success. All that is known at present is that it is of the order of several pounds of starch equivalent per day per cow, and that it is certainly more for poor pasture some distance from the milking shed than for good pasture near the milking shed. For the present, the only possible course is to make a more or less intelligent shot at the average quantity. Let us suppose that it is on the average $1\frac{3}{4}$ lb. of starch equivalent per day. There will then be 14 lb. of starch equivalent per day left for milk production. On the official figure of $2\frac{1}{2}$ lb. of starch equivalent per gallon, this should suffice for between 5 and 6 gallons per day. This quantity of milk would require, at .6 lb. of digestible protein per gallon, not more than $3\frac{1}{2}$ lb. of digestible protein. And the grass consumed, after subtraction of maintenance, supplies to the cow $6\frac{1}{4}$ lb. For deep milkers on grass, therefore, if any concentrated supplement is required, it should be something rich in carbo-hydrate, as, for instance, some kind of cereal, rather than a cake rich in protein. In all the above it is assumed that the cows are on pasture which is well managed, that is to say, stocked so that it is never allowed to grow long.

Admittedly, much more information is required, especially on the question of the weight of starch equivalent used up in walking, before it is possible to calculate the requirements of concentrates of cows on pasture, but it is claimed that the above described method of looking at the subject is a distinct advance, in that it shows in what directions further investigation is necessary. When once it is known what information is needed, that information is often not long in coming. From the point of view of the livestock owner, pastures may be regarded as differing in two ways. In the first place, they differ in what may be called density of herbage or number of blades per square foot. The denser the herbage, or the more blades per square foot, the more the animal will eat per bite, the quicker she will fill herself, the less the distance she will have to walk, and the more the time she will have for rest and cud chewing. Secondly, pastures differ in their

rate of growth at different periods of the grazing season. Good pasture grows about the same weight of grass every week in the season from the end of April to the end of September. Its growth rate is uniform throughout the season. Pastures are good in proportion as their growth rate approaches uniformity.

Many pastures, however, make little growth early in the season. At the first onset of warm wet weather they produce a flush of grass for a short time. As soon as this flush is over their growth remains scanty for the rest of the summer, varying somewhat with warmth and rainfall.

Density of herbage and uniformity of growth rate are the most important qualities of a pasture. The really first class pasture possesses dense herbage and a uniform growth rate. It can be stocked to its full capacity and will carry a full complement of animals throughout the season. It is, therefore, comparatively easy to manage.

Uniform growth rate, even if not associated with dense herbage, characterises a pasture which can be stocked to its full capacity and is, therefore, capable of good management. The pastures which are really difficult to manage are those which grow slowly, except at the first advent of warm moist weather when they produce a sudden and short lived flush of grass. If stocked on the basis of their early and late growth rate, when the flush comes the stock cannot cope with it. As the farmer says, the grass grows away from the stock and gets trampled down. The animals for the rest of the season live on what is practically spoilt hay, from which they can only extract perhaps 6 or 7 per cent. of digestible protein and 30 per cent. of starch equivalent. Such pastures, of which there must be many millions of acres, cannot be grazed effectively. They are often cut over for hay, but at the present time coarse fodders like hay and straw are excessively cheap and concentrated productive fodders are correspondingly dear. These prices merely reflect the fact that for modern methods of high production, both of milk and of other animal products, coarse fodders are required in decreasing quantity, whilst the demand for concentrates is in excess of the supply.

Now pastures of this type, according to Woodman's findings, during their period of flush growth pass through a productive stage when their dry matter contains over 20 per cent. of digestible protein and 65 to 70 per cent. of starch equivalent. The problem is to catch their herbage at this productive shape. This can be done by cutting them at short intervals, say, fortnightly during their flush growth period and by preserving the cuttings.

In the summer of 1926, the writer was able to get about 4 or 5 cwt. of such cuttings dried by Dr. E. S. Beaven of Warminster, in his malt kiln. About 1 cwt. of dry matter resulted which was pressed into

cakes in the School of Agriculture. The cakes on analysis were found to contain well over 20 per cent. of protein and very high percentages of soluble carbo-hydrates. Some of them have kept in good condition up to the time of writing.

In the summer of 1927, Messrs. Nitram, Ltd., were good enough to dry and press for the writer about 5 tons of such grass cake. A digestibility determination carried out in the School of Agriculture by Dr. Woodman showed that they contained 20 per cent. of digestible protein and 70 per cent. of starch equivalent. On the Cambridge University Farm a yard of bullocks were fed on hay and oat and tare silage with 6 lb. of grass cake per day as their only concentrated food. They put on over 2 lb. of live weight increase per day and made top price in the market. In addition, six milch cows were fed on a small maintenance ration of hay to which was added a production ration of grass cake and crushed oats supplying, per gallon, the normal allowance of $2\frac{1}{2}$ lb. of starch equivalent and .6 lb. of digestible protein. For this purpose the grass cake and oats were mixed in the proportion of 3 : 1. The cows thus fed, kept up their milk yield rather better than the rest of the herd and practically maintained their live weight. One of the cows gave on the average 6 gallons of milk per day. The experiment was continued for 6 weeks.

These experiments show that cake made by cutting and drying and compressing young grass is a concentrated food of approximately the same composition, digestibility and nutritive value as linseed cake. The possibility of cutting, drying and compressing so as to sell at an economic price still remains to be worked out. The writer hopes to be in possession of a portable cutting and drying machine by the beginning of next season, when the economic possibility of the method will be studied. It is probable that this method of preserving young grass will not destroy its vitamins, in which case grass cake should be especially valuable for the winter ration of milch cows, since it would maintain the vitamin content of their winter milk.

Still another possibility is the preservation of young newly cut grass by ensilage. Dr. Woodman has succeeded in producing very satisfactory silage from cricket ground cuttings on the experimental scale. Large scale trials will be carried out at Cambridge next summer so that economic possibilities may be investigated.

MILK RECORDING.

By JAMES MACKINTOSH, O.B.E., N.D.A., N.D.D.

THE object of this article is to give an account of the progress of milk recording amongst the dairy farmers of this country, to discuss some of the problems which have arisen, and to consider and outline the developments which are still necessary in order that dairy farmers may gain the greatest possible benefits from this part of herd management.

Milk recording is to many farmers a comparatively new idea, and, although the practice has become much more popular during the last ten years, there are still thousands of dairy farmers who consider the weighing of the milk of individual cows in their herds an unnecessary and unprofitable labour. In view of this example of the hesitation of the English farmer to adopt a new idea and apply it to his own conditions, it is interesting to learn that in at least one dairy herd milk recording was practised over one hundred years ago.

Early in the nineteenth century, William Harley established the Willowbank Dairy on the outskirts of Glasgow, and developed a system of management which we would now describe as town or city dairying. His main object was to supply the inhabitants of the city with milk of a quality they might rely on, and by 1814 his dairy of nearly 300 cows had become famous throughout the country. Amongst the many novel points in his management, it is stated that on "one day in every week at least (Friday was the usual day at Willowbank), it was the custom to measure the quantity of milk supplied by each cow, morning and evening."

He also used lactometers and milk tubes to determine the quality of the milk yielded by each cow, in order that the milk which produced most cream might be selected for cream raising.

For the next seventy years the pioneer work of Mr. Harley seems to have been entirely forgotten, but from 1880 onwards the Journals of the Royal Agricultural Society contain occasional references to milk records, and to the yields given by individual cows in a few herds in the hands of progressive owners.

At the Dairy Show, held in 1885 by this Association, a paper on "Milk Registers," read by Dr. Fream, attracted some attention, and in 1887 a Dairy Farm Records Competition was organised, and the gold medal of the Association was offered "for the best kept and most practically useful record which shall show :—

- (1) The yield of milk from an entire herd of dairy cows, not to number less than 20, of any breed, for 12 consecutive months, from 31st March, 1887, to 31st March, 1888.
- (2) The breed, age, last date of calving and number of calves.
- (3) A balance sheet for the period."

The Journal of this Association for 1889, contains an interesting article on "Lessons from my Milk Register," by Primrose McConnell, B.Sc., and in the Journals of later years numerous articles appeared advocating the keeping of milk records.

MILK RECORDING BY SOCIETIES.

Systematic milk recording, as now understood and carried out according to a definite scheme by a society of farmers, was apparently devised by a group of Danish farmers around Vejen, in Jutland, in 1895, and in 1903 a few societies were formed in Scotland under the auspices of the Highland and Agricultural Society.

In England and Wales a few milk record circuits were formed by Agricultural Colleges and County Councils prior to 1914, but it was in the latter year that the Ministry of Agriculture issued a scheme for the formation of societies, and agreed to make grants of money in aid of this work to societies operating according to the rules and regulations laid down by the Ministry. This scheme for the development of milk recording was a part of a national plan of live stock improvement inaugurated by the Development Commissioners.

The general conditions under which these societies operate are now well known and need not be summarised here.* In 1914 some 15 societies commenced operations, but, owing to the War, little progress was made during the next four years ; from 1918 to 1924 many new societies were formed and others gained many new members, but during the last four years the rate of progress has fallen considerably, and several societies have found it difficult to maintain their previous membership.

*Full details can be obtained on application to the Ministry of Agriculture, Live Stock Branch, 10, Whitehall Place, or from any County Milk Recording Society.

The following table gives the total membership in each year since official recording was commenced in 1914-15, together with the number of herds and cows recorded up to 1st October, 1927.

Year.*	Societies.	Members.	Herds.	Cows.
April 1st to March 31st—				
1914-15	16	264	206	7,331
1915-16	20	350	398	9,811
1916-17	22	441	495	12,950
1917-18	25	503	555	14,404
October 1st to September 30th				
1917-18	27	639	708	19,793
1918-19	38	1,191	1,332	37,880
1919-20	46	2,075	2,312	61,323
1920-21	52	3,328	3,664	97,903
1921-22	55	3,949	4,362	117,023
1922-23	55	4,365	4,767	127,151
1923-24	52**	4,764	5,209	138,086
1924-25	50**	5,081	5,516	148,905
1925-26	49**	5,174	5,656	154,322
1926-27	51†	5,166††	5,650††	156,847

* Before October 1st, 1917, there was no uniform year for Societies.

** The decrease in the number of Societies was due to amalgamation.

† The increase in the number of Societies is due to the dividing of one Society covering three counties into separate Societies for each county.

†† Including 35 members recording goat herds only.

The figures given above show the number of herds where the records of yield are supervised and checked according to the Ministry's scheme, but there are many other farmers who keep private records for their own guidance in the selection, breeding and feeding of their herds.

ADDITIONAL WORK DONE BY SOCIETIES.

In addition to the weighing of the milk of individual cows, either at every milking or at two successive milkings each week, the Milk Recording Societies assist their members in other ways, which will be briefly mentioned.

ADVICE ON RATIONING.

Most societies have made arrangements with the Agricultural College or the University Agricultural Department in their area, or with the County Agricultural Organiser, to provide their members with advice on the selection of rations and the purchase of concentrated foods. Numerous investigations during the last 20 years showed that there was room for great improvement and economy in the feeding of dairy herds, and in 1924 the Ministry of Agriculture appointed a Departmental Committee to advise as to a uniform scheme of advice on the rationing of dairy cows for general adoption throughout the

country. The report of this Committee provided a basis for this work in counties where little had previously been done, and many farmers have found that an examination of the rations at present in use, and changes in the kinds and proportions of the foods used, have led to increased production at a lessened cost. No member of a Milk Recording Society, nor, indeed, any dairy farmer throughout the length and breadth of the country, need be in ignorance as to whether he is feeding wisely and economically. Where incorrect and wasteful feeding exists the farmer has only himself to blame, in that he does not enlist the free services of the advisers in the county who are ready and willing to assist him.

CALF MARKING.

In days gone by many farmers reared calves to replenish their herd, but took no steps to mark each calf, so that it could be identified later when it was old enough for service or came into the milking herd. This neglect is a great handicap to improvement by breeding, and one of the most helpful activities of Milk Recording Societies is the calf marking scheme, whereby calves are tattooed in the ear with a distinctive number within a few weeks of birth, and all particulars of breeding noted, so that each animal may be identified and its family history ascertained at any future date. This calf marking system is recognised by some of the Dairy Breed Societies which have schemes for the grading-up of females, sired by pedigree bulls, for entry in the breed herd book, and in this way many farmers have been helped materially in the improvement of their herd and in breeding up towards pedigree standard. In 1926-27, the number of calves out of milk-recorded cows tattooed by Milk Recording Societies was 15,947.

MILK FAT TESTS.

The Milk Recording Scheme inaugurated by the Ministry of Agriculture differs from the schemes in practice in many other countries (Scotland, Ireland, Denmark, &c.), in several respects, and particularly with regard to the facilities for milk fat testing. In these countries visits by the recorders are paid to the farms of members of societies at intervals of from 14 to 28 days, and at each visit the milk produced by each cow is weighed and samples taken and tested for the fat content; in fact, therefore, the testing of the milk of each cow is an essential part of the Milk Recording Scheme, and is considered as important as the weighing of the milk of each cow. In England and Wales, on the other hand, while it is recognised that no system of milk recording is complete if it does not take account of the quality as well as the quantity of the milk, the taking and testing of samples is optional, and societies only undertake this work at the definite request of members, and then usually only for bulk samples or for a few individual cows.

Further, though the method by which samples shall be taken by recorders is set out in detail (see Ministry of Agriculture Leaflet 146), no method of testing is specified, nor are any directions given as

to how the average percentage of fat for a day or for a lactation shall be calculated. The need for guidance in this matter will be referred to later in this article.

HERD COMPETITIONS.

Many County Milk Recording Societies now carry out annually herd competitions for the benefit of their members. Challenge cups, trophies and prizes are offered, and usually each competition is divided into classes for herds of different sizes. The placing in each competition is decided by points, and points are awarded under the headings of (a) average milk yield for the year; (b) proportion of home-bred stock; (c) average milk fat content (in a few competitions only); (d) breed type, uniformity, healthiness and general management of the herd. Some societies also run competitions for bulls and their progeny; for young stock and for any other purpose which will help their members.

Through the medium of such competitions many dairy farmers who have developed excellent herds of home-bred stock by careful and persevering good management, have received well-deserved recognition. There can be little doubt that it is a more meritorious performance to breed and develop a first-class herd, than to exhibit a few winners at the larger shows.

THE PROBLEMS OF MILK RECORDING.

At the present time the most urgent problem facing those who are responsible for the working and efficiency of Milk Recording Societies, is how to maintain and increase membership, and a consideration of this matter will involve reference to other related problems.

HOW TO MAINTAIN AND INCREASE MEMBERSHIP.

The figures given in the table on page 66 show a distinct slowing-up of the rate of increase during 1927, and, if one may judge from opinions expressed in many counties, the membership as a whole during 1929, will be somewhat lower than in 1928. In view of the comparatively small proportion of dairy farmers who are as yet members of Milk Recording Societies, this decrease is very disappointing. The Annual Returns, issued by the Ministry of Agriculture for June 4th, 1927, give the total number of "cows and heifers in milk," and "cows in calf but not in milk" as 2,403,446. This total includes many animals, such as those of beef breeds, and others kept for private use on farms other than dairy farms, which can never be expected to be included as "recorded cows," but even if an allowance of 25 per cent. be made to cover such animals, there still remains the large number of 1,802,600 cows, kept primarily for the production of milk and which, therefore, ought to be "recorded cows." Since the actual number officially recorded in 1926-27 was 156,847, this rough-and-ready calculation indicates that only some 8.7 per cent. of the dairy cows

in England and Wales are in officially recorded herds. The balance of 1,645,753 cows must represent many herds where the owner is neglecting to obtain for himself much information about his cows which others have found invaluable as an aid to greater economy and profit.

It seems worth while to attempt to find out why milk recording through the membership of County Societies receiving financial assistance from the State, should not be more generally practised and, in order to throw more light on the subject, the County Societies have been grouped in the following table in the order of the percentage of recorded cows in the county.

TABLE 2.

SHOWING ESTIMATED PERCENTAGE OF RECORDED COWS IN MOST OF THE COUNTIES OF ENGLAND AND WALES.

<i>County.</i>	<i>Per Cent.</i>	<i>County.</i>	<i>Per Cent.</i>
Hertford	30.0	Monmouth	5.1
Berkshire	25.8	Derby	5.0
Essex	23.8	Northumberland	4.8
West Sussex	21.4	Cumberland	4.3
Surrey	20.1	Westmorland	
Suffolk	19.7	Devon	3.8
East Sussex	17.2	Durham	3.5
Norfolk	16.4	Shropshire	3.2
Oxford	15.8	Stafford	Under 2.0 per cent.
Cambridge and Isle of Ely	15.2	Denbigh and Flint	
Hampshire and Isle of Wight	14.9	Lancashire	
Wiltshire	12.6	Herefordshire	
Bedfordshire	12.3	Glamorgan	
Kent	11.9	Cheshire	
Warwick	9.5	Anglesey and Carnarvon	
Somerset	8.4	Lincoln	
Dorset		Cardigan	
Gloucester		Cornwall	
Bucks	7.7	Montgomery	Under 2.0 per cent.
Northampton	7.3	Yorkshire	
Leicestershire and Rutland	7.1	Merioneth	
Worcestershire	6.6	Carmarthen	
Notts	6.0	Pembroke	

The above percentages have been calculated from the total number of cows recorded by each Society in the year ended October 1st, 1927, given in the Journal of the Ministry of Agriculture, August, 1928, and the total number of "cows and heifers in milk" and "cows in calf but not in milk" for each county on June 4th, 1927, as given in Agricultural Statistics, 1927, Part I.

It must be explained at once that the figures given above are only estimates, and that it is impossible to get the actual percentages because the border-line of a society's activities often does not exactly

follow the county boundary. For example, the Hertfordshire and Surrey Societies include some herds in the adjacent county of Middlesex, which has no Milk Recording Society of its own, and the Berkshire Society includes a few herds in South Oxfordshire, within a few miles of Reading. Sometimes also, a county has two or more societies, or a society covers more than one county and in such instances the societies or the counties have been grouped together for the purpose of arriving at a percentage figure. In spite of these variations, however, the table undoubtedly indicates those counties where milk recording by societies has been most keenly taken up, and correspondingly indicates those where little progress has been made.

From the table on page 69 it appears that in some 11 counties, 15 per cent. or more of the cows are recorded; then follows three counties with from 15 to 10 per cent. and several others approaching this figure. At the other end of the table there are several counties noted for their dairy farming and containing very large numbers of cows where the percentage recorded ranges from 4 per cent. downwards.

When the position of the 14 counties with over 10 per cent. of their cows recorded is located on the map an interesting point emerges. All, with the exception of Wiltshire, are situated in the south-eastern quarter of England—east of a line drawn from Bournemouth to Banbury and south of a line from Banbury to King's Lynn. The question at once arises as to why this geographical grouping should occur, and at the same time one is led to ask why the western counties, which have long been recognised as the main centres of dairy farming in this country, should apparently fail to appreciate a movement intended solely for the guidance of the dairy farmer.

The southern and eastern counties of England differ from other parts in the nature of the soil and in climatic conditions generally, which, on the whole, are less favourable to milk production, also dairy farming has only been taken up within comparatively recent times, and it may be suggested that the difficulties which confront the dairy farmer in these counties and the lack of local tradition and inherited knowledge or prejudices, have made him more ready to take advantage of new methods, such as systematic milk recording, which aid materially in increasing returns and diminishing losses.

The argument may be advanced that the knowledge and experience possessed by dairy farmers in the older dairying districts make recording unnecessary, and that they can manage their herds economically and profitably without milk records. A moderate degree of success can, no doubt, be attained, but a sufficient number of farmers of long experience have taken up recording and found it a helpful and profitable innovation to make this point of view untenable. The degree of success attained without the aid of milk recording, can be intensified by making use of the information which records supply

in the detection and elimination of unprofitable cows, in more economical feeding, and as a guide to improved methods of breeding.

It appears probable that the reasons why more farmers do not become members of Milk Recording Societies are as follows:—

(a) That they keep private records, and do not believe that the information which official milk records supply is worth the money, time and labour spent in obtaining it.

(b) That they give general adherence to the principle of milk recording by societies, but they consider many of the regulations imposed by the Ministry of Agriculture unnecessary and irksome, and prefer not to be bound to comply with them.

(c) That they do not realise the value of milk records as a guide to profitable management.

PRIVATE RECORDS.

With regard to private records there is no doubt a large and increasing number of farmers who believe that records kept according to their own methods provide all the information they require. Many of these may have gained their experience of recording as members of some society, and, in order to reduce expenditure, have resigned their membership. It is quite true that properly kept private records can supply all the information needed to detect the good and the bad cows, to enable the herd to be fed wisely, and to improve the general management, but private records cannot have the commercial value of officially checked records when it is desired to sell a good cow or her progeny, or when a herd must be disposed of. Further, many of the Dairy Breed Societies accept for publication in their year-books or for entry in their advanced registers only those yields which have been checked under the auspices of a society operating under the supervision of the Ministry of Agriculture, and only accept calves for entry in supplementary and grading-up registers, which have been ear-marked by a recognised Milk Recording Society, hence, membership of a society is necessary in order to take advantage of many of the helpful schemes carried out by the Breed Societies.

At the present time, however, the great majority of milk-producing farmers are not members of any Breed Society, and the main reasons why they should be members of a Milk Recording Society are (1) that verified records increase the value of good stock and their progeny; (2) that the Ministry of Agriculture provides, free of charge, the ruled sheets and books required for keeping the records; (3) that the recording is kept reasonably up-to-date (a statement which frequently cannot be made about private records); (4) that samples of milk can be tested at a low cost for fat content at regular intervals; (5) that advice on rationing and on other matters affecting the cost of milk production can be easily obtained; and (6) that the Ministry of

Agriculture assists each society financially, so that the whole cost of this work does not fall on the members. The amount of this monetary assistance is at the rate of £3 10s. per herd for each of the first two years of the owner's membership, and at the rate of £3 for each year thereafter, provided that the total amount does not exceed one-half of the expenses necessarily incurred by the society in the work of milk recording and calf marking, and provided that the annual return of the milk yield of the herd for the year is duly supplied. In fact, therefore, by becoming a member of an official Milk Recording Society and complying with the rules (as is done by over 5,000 farmers throughout the country) a milk producer can get most helpful assistance at £3 less than its annual cost. In 1926-27 the average cost of recording over the whole country was 4s. 4d. per cow to the member, and 6s. 3d. per cow to the Society, in other words 30 per cent. of the cost is met by the grants from the Ministry of Agriculture.

IRKSOME REGULATIONS.

The second reason suggested above, why farmers do not join or remain members of Milk Recording Societies is that they consider many of the regulations irksome and prefer not to be bound to comply with them. There have, no doubt, been instances when a failure to have the herd register up-to-date, or to enter the ear-numbers on the weighing sheets has been emphasised in a tactless manner, but it will readily be granted that official records depend on their accuracy and reliability for their value, and if the observance of rules which have been found to be necessary for this purpose keeps a few farmers out of societies, this state of affairs is, in fact, to be preferred to conditions where the methods in general use might lead to the reliability of the records coming under suspicion. It is also true that some of the rules which appear unnecessary at first, are approved of later when a farmer begins to make full use of his records in the management of his herd.

VALUE OF RECORDING NOT REALISED.

A third reason suggested is that many dairy farmers do not yet realise the important part that milk recording can play in herd management. It is, perhaps, an over-statement that many who do not keep records are satisfied with the financial returns they receive from their herds, but it is certainly true that no farmer who does not keep records has any right to complain if his returns are poor. He is neglecting to make use of a means of improvement lying ready to his hand, and part of the cost of which is met by Government grants.

The Ministry of Agriculture, the Agricultural Colleges, the County Agricultural Staffs, the Agricultural Press, in fact, every one interested in the improvement of dairy farming, has written and spoken on the value of milk recording, but the need still exists for propaganda and

educational work. Some societies are more energetic than others in trying to increase their membership, and various measures are adopted, such as the inauguration of herd competitions with special prizes, or sections for novices; the holding of meetings on the work of the society in the chief dairying districts of the county; the publication of an annual report and year-book and the award of bonuses to the recorders for the introduction of new members. An increase in membership means a reduction in overhead charges and paves the way to a lower annual levy per cow, hence, every member should be always on the look-out for a new member. If one considers the annual payments somewhat high, the correct procedure is to get more members—not to resign oneself.

Each society, after a few years work, can get numerous examples from amongst the herds of its own members, of very definite increases in yield, and several such illustrations are given annually by the Ministry of Agriculture. Four such are given below:—

HERD.	No. of years during which records were taken.	Average yield per cow in first year.	Average yield per cow in last year.	Increase in annual average yield per cow.	No. of full-year cows in last year of period.	Cash value of increase of last year over first year at 1s. per gallon.	
						per cow.	per herd.
I Non-pedigree Shorthorn ...	6	Gal. 653	Gal. 821	Gal. 168	14	£ s. 8 8	£ s. 117 12
II Non-pedigree Shorthorn ...	6	563	1,194	631	8	31 11	252 8
III Pedigree Guernsey . . .	5	650	1,015	365	13	18 5	237 5
IV Pedigree Friesian ...	7	848	1,087	239	35	11 19	418 5

Increases in the cash value of the return per cow quoted above, range from £8 8s. to £31 for five to seven years' recording and making use of the records as an aid to herd management. In each case the cost of membership and the other work involved has yielded a handsome return, to say nothing of the increased capital value of the herds of cows and their progeny due to the possession of records of production checked by an independent authority.

CAN THE COST OF RECORDING BE REDUCED ?

The figures given on page 73 illustrating the increased returns following the adoption of systematic recording would appear to be convincing enough, but in so far as the income from additional milk produced is merely part of the weekly or monthly income, whereas the payments to a society have to be made in lump sums twice yearly, the cost often *appears* unduly large. There is no doubt that an annual levy of say 4s. per cow on a herd of 40 cows, paid in two instalments of say £5 and £3, constitutes a payment which every dairy farmer would wish to lessen, and it is desirable to consider to what extent and in what ways the cost might be reduced.

The main item of expenditure in any society's balance sheet is the salaries of recorders. The salaries paid and the mode of reckoning payment vary in different societies, some paying an annual salary, including an allowance for travelling expenses, and others paying a fixed sum for each visit (including evening and morning milkings) to a farm; also some recorders are full time men and others are employed for part time only. There is no evidence that recorders are in any way overpaid, considering the arduous nature of their duties under the existing conditions and the need for accuracy and reliability in the work they have to do, so that the probability of any appreciable economy under this heading may be ruled out.

In some countries the general scheme of work is different, and the recorders are boarded over-night by each member when they visit his farm. Under this system somewhat lower salaries may be acceptable and the travelling expenses are less, while the additional expense incurred by the member is scarcely noticed. Under the English scheme, however, it is required that the visits paid by the recorder to check the records of a member should not be notified beforehand and recorders may not be "put up" by members, so that it is not possible here to adopt the less costly method practised elsewhere. Further, there are many societies in England who would rather meet the costs of the present system and retain the principle of unnotified visits, than change to a method which under certain circumstances might depreciate the reliability of the records.

The suggestion has also been made that recorders need visit a herd to check one milking only every four or six weeks instead of checking each milking in a twenty-four hour period at least every six weeks as at present. If this suggestion were adopted each recorder could certainly supervise a larger number of herds, and the cost to the society would be reduced, but again the reliability of the work and the advantages offered to members in other respects would suffer. In fact, a strong case has been made out that, where the important adjunct to checking yields of milk, namely, sampling and testing the milk

of individual cows for its fat content is required, visits should be made more frequently than at intervals of six weeks.

Apart from the salary paid to recorders, the travelling expenses incurred (either as a definite allowance or as part of the salary) are greater where the herds of members are widely scattered. Some societies have lessened their expenditure by engaging part-time recorders mainly, so that each recorder is responsible only for a few herds in his own district and perhaps an extension of this system might be of assistance, combined with an increase in membership, especially in districts where dairy farming predominates. When considering any economy which may be possible by employing part-time recorders, it must be remembered that the efficiency of the checking system should not be lessened in any way.

The other items of expenditure in the annual balance sheet are comparatively small, and though all possible economies should be introduced, these, taken as a whole, could scarcely affect the amount of the annual levy.

If the costs can be lessened only slightly or not at all, it might be well for Committees of Management to consider what other services can be rendered to members without additional cost to the society. The Ministry of Agriculture stipulates that the cost of calf marking shall be not less than 6d. per calf, and since each calf is marked by the recorder at his periodical visit, societies may increase their revenue slightly by explaining, wherever necessary, the advantages of this scheme and thereby increasing the number of calves marked annually. In many counties also, special arrangements are made to assist members of societies to ascertain the quantities of the different foods constituting the daily ration of the herd and the cost of the same, and advice is given as to how the ration may be improved and the cost of milk production lessened. Work of this nature has been of immense value in several counties and, with the changes from year to year in the supplies of home-grown foods and the cost of purchased concentrates, there is an annually recurring need for advice on the selection of an economical and suitable ration. A few suggestions on this subject may easily lead to a saving or to an increase in production which in a few weeks will more than equal the annual levy.

In some instances also, arrangements are made to circulate in the society particulars of calves, heifers, cows or bulls, which a member may have for sale, thus assisting both vendor and purchaser.

CAN ANY OTHER WORK BE UNDERTAKEN BY THE RECORDERS ?

From time to time suggestions have been made that the society could assist its members in other ways by permitting the recorders

to undertake other duties such as assisting in the keeping of the herd register, marking of calves with Breed Society tattoo marks, &c. In some counties also, recorders render helpful service by taking samples in connection with County Clean Milk Competitions.

As a rule, requests of this nature are made without a full knowledge of the duties which a recorder should fulfil at each visit to a member's herd, and when, in addition to checking "the entries, calculations and additions," on the cowshed weighing sheets and the annual register, recorders have also the fill up their own report forms, check the accuracy of the weighing apparatus, tattoo new cows and recently born calves, and, if desired, take samples of milk for fat testing, and aid the owner in finding out the weights of foods composing the daily ration of the herd, it will be understood that the placing of any additional duties on their shoulders should only be done, if it can be shown indisputably that the accuracy and reliability of the records, &c., will not suffer in any way.

MILK FAT TESTING.

Another problem associated with milk recording as carried out in England and Wales is that of the development and recognition of milk fat testing.

The Ministry of Agriculture, in an explanatory pamphlet on the official scheme, point out that "no system of milk recording is complete if it does not take account of the quality as well as the quantity of the milk, and this fact should be specially borne in mind, and acted on by farmers who carry on dairying for the purpose of making butter or cheese or who are paid for their milk according to the quality they supply." Owing, however, to the fact that the large majority of dairy farmers sell their milk wholesale and that the quality—provided it reaches the legal standard—is not of much concern, milk fat testing under the official scheme is optional to members, but the society must provide for the taking of samples by their recorders, and the testing of the same, if any member requests this work to be done, and undertakes to pay the necessary charges. The scheme further stipulates how samples of mixed milk and samples from the milk of individual cows shall be taken, and the hope is expressed that when farmers have satisfied themselves of the commercial value of recording they will appreciate the advantages of taking tests for milk fat. The cost of such testing is usually from 3*d.* to 6*d.* per sample.

It may be advisable to give here a few illustrations of the manner and the extent to which milk fat testing can be of advantage to a considerable proportion of the dairy farmers in this country.

Firstly, where milk is made into butter and cheese, the percentage of fat in the milk directly influences the quantity of these products

which can be obtained from it. This fact and some measure of its relative importance is shown in the following table :—

EFFECT OF PERCENTAGE OF FAT IN MILK ON THE QUANTITY OF BUTTER AND CHEESE OBTAINED.

BUTTERMAKING.			CHEESEMAKING.		
Quantity of milk used.	Percentage of fat.	Probable weight of butter made.	Quantity of milk used.	Percentage of fat.	Probable weight of cheese made.
lb.	%	lb.	lb.	%	lb.
6,000	3.5	226	6,000	3.0	527
6,000	4.0	261	6,000	3.5	569
6,000	4.5	296	6,000	4.0	618
6,000	5.0	332	6,000	4.5	655
6,000	5.5	367	6,000	5.0	684

The above comparisons show clearly the advantage to the butter maker and cheese maker of finding out those cows in his herd which produce poor and rich milk—a poor yielder which also produces poor milk is a definite source of loss, whereas a good yielder which produces rich milk is a direct source of profit. In view of the strenuous competition from overseas, the English dairy farmer who is largely dependent on butter or cheese for his income, should call fat testing to his aid in order to increase the amount of saleable produce from the same expenditure on food and labour.

Secondly, a number of dairy companies purchasing milk wholesale have recently introduced a system of payment of bonuses for milk based on its cleanliness and milk fat content. In one instance, the bonus is an extra one-tenth of a penny per gallon for one-tenth per cent. of fat over 3.5 per cent. This is equal to $\frac{1}{2}d.$ per gallon extra for milk of 4 per cent. fat, and if applied to the individual cows in a herd, a 600-gallon yield of 4 per cent. fat will bring in 25s. per annum more than a 600-gallon yield of 3.5 per cent.

It appears most probable that this system will become increasingly common, and that the farmer selling milk wholesale, who formerly was mainly concerned in keeping his milk above the legal standard, will find it to his advantage to detect and dispose of those animals in his herd which naturally give milk of low quality.

Thirdly, the dairy farmer, who maintains his herd by breeding, and the owner of a pedigree herd who rears bulls for sale, should beware lest a concentration of attention on high yields leads to a gradual deterioration in the quality of the milk produced in his herd. The current belief that high yield and low quality of milk go together is supported by a considerable amount of evidence, but it is equally

true that there are numerous instances where high yield and high fat percentage are found in the same animal. In many herds bulls are selected for use because their dams were heavy yielders, without any consideration of the quality of the milk, and a succession of such bulls, while increasing the yield in the herd will also most probably lower the quality. That the yield and the quality can be *improved at the same time* by the selection of bulls from cows which possess both these good features is amply proved by the results obtained in many Danish herds, and several instances of this improvement are given in the following table :—

INCREASES IN YIELD AND IN BUTTER FAT OBTAINED IN
DANISH DAIRY HERDS.

Breed.			Year.	Yield of milk per cow.	Milk fat.	Yield of butter per cow.
				lb.	%	lb.
<i>Red Danish</i>	...		1905-06	9,427	3.40	356
			1915-16	11,282	4.30	546
<i>Jutland</i>	...	...	1900-01	5,315	3.09	183
			1916-17	8,175	3.87	354
<i>Shorthorn</i>	...	...	1903-04	6,349	3.30	238
			1915-16	9,445	3.85	407

Readers may note from the above table that systematic records of herds were obtained in Denmark from 1900 onwards; and that in ten years' time a very definite increase in the average yield of milk and fat percentage per cow had been brought about.

While it is quite correct to say that fat tests of the milk of individual cows can be obtained by members of official Milk Recording Societies, and are, in fact, obtained by a considerable number of owners of pedigree herds, it is equally correct to say that no systematic effort has been made to bring home the advantages of such information to the butter and cheese maker. The table given on page 69 shows that milk recording is much less popular in the western cheese-making counties than in those primarily devoted to milk production for wholesale disposal, and the question may be asked if this lack of interest in the butter and cheese areas could not be greatly overcome by laying stress on the benefits to be derived from complete milk recording, *i.e.*, records of yield and fat.

There is also an unfortunate gap in the official scheme in so far as no advice is given on or methods laid down for the calculation of the milk fat average for a year or for a lactation period. The result

of a test taken once in a lactation period is sometimes quoted as representative of the average fat content of the milk of a cow, and often where several samples have been taken these have been wrongly averaged and erroneous conclusions arrived at. Some of the Dairy Breed Societies have studied this matter and devised methods of their own for calculating a lactation period average, and a recent movement towards uniformity of method by several Breed Societies is to be commended. The farmer who is not a member of a Breed Society, however, but who has samples taken periodically for his own information, receives no guidance in the correct use of this information, and there is a distinct danger of societies in different counties adopting varying methods. If it is worth while providing members of societies with the means of getting milk fat results, surely it is equally important that they should be advised as to the correct method of using these results. Nearly 92,000 samples of the milk of individual cows were taken in 1926-27.

In view of this volume of testing, it seems distinctly unfortunate that the report issued for 1926-27* should contain the following statement: "Further representations have been made during the past year that the Ministry should lay down some definite system for testing butter fat, but this has not been found practicable, as up to the present no reliable and workable scheme has been devised." Several Breed Societies such as the English Guernsey Cattle Society, the English Jersey Cattle Society and, recently, the Dairy Shorthorn Association, have devised schemes and accept the results for the publication in their year-books, and one must continue to hope that such schemes will be improved and harmonised until such a time as a uniform scheme and method, tested and tried for several years, will be accepted by the Ministry of Agriculture, and a statement in respect of fat percentage added to the statement of milk yield given on the Milk Record Certificates and the Certificates of Merit issued by the Ministry.

No article on milk recording in England and Wales would be complete without acknowledging the great help which the movement has received from the Ministry of Agriculture through the Live Stock Branch and its representatives in the different districts. The progress which has been made is primarily due to the inauguration of the official scheme by the Ministry in 1914, but the great need for an extension of the work must also be recognised. Any criticisms or suggestions in this article are given with a view to helping this extension, and enabling the great work of milk recording to be of still greater benefit to the dairy farmers of this country.

* Live Stock Improvement Scheme Report, Journal of the Ministry of Agriculture, August, 1928, page 466.

THE GRADING OF BRITISH DAIRY PRODUCE.

By T. C. GOODWIN.

“**SPLENDID** Producers but poor Marketers.” Such is the substance of a criticism of the British Dairy Farmer passed by a gentleman who occupied the very distinguished position of President of the Board of Agriculture some years ago. It was a double edged opinion, on the one hand paying a high compliment, while on the other passing a rather severe stricture on incompetence. In effect it said—“Here is a body of men who make a number of excellent things—things that the public want and, indeed, use every day, their excellence being beyond question—but they do not know how to sell them. As a result of this, the arduous occupation in which they are engaged languishes, while other men competing with them in the production of similar articles, which in many cases have to be transported over thousands of miles of land and sea, are able to market their goods with a larger amount of success and profit to themselves to the displacement of home products. Why is this? Numerous answers to this query have been given, of which the following are a selection.

- (a) The quality is better.
- (b) The climate of competing countries is more suitable for production.
- (c) Costs of production are lower.
- (d) British consumers do not loyally support the home producers.
- (e) Scientific instruction in competing countries is more advanced and more closely followed than by farmers at home.

The answers may briefly be given as follows :—

- (a) An emphatic No.
- (b) There is no evidence in favour.
- (c) Yes, but when transport costs are added the difference is not so great as at first appears.
- (d) The attitude of the great British Public is more one of indifference than antipathy to the British farmer and his interests, he buys what suits his taste and his pocket.
- (e) We must admit with regret that the attitude of mind of the home producer to the many ways in which science can help him has been far from satisfactory, but there are indications that he is outgrowing it, while in some competing countries the scientist largely dominates the situation.

Taking all these considerations into account, however, and making the most of them, they do not give a satisfactory answer to the question of why British dairy products do not take the lead and keep it in our own home markets? The answer is fairly obvious to those who give careful thought to the matter. Competing products are classified, selected, graded, speaking broadly. OURS ARE NOT. Our competitors cannot afford to send their goods into our markets without classification for more reasons than one, and so the indifferent samples are kept at home and only those which pass successfully the somewhat rigid inspection are exported. That creates confidence on the part of traders in this country and they are able, when prices are favourable, to buy large consignments for future delivery as required by the purchaser, relying on the guarantee which is given and is indicated by the brand. It follows also that the price is stabilised and is not subject to those violent fluctuations which are the curse of any commodity. It is no mean achievement on the part of our competitors whether colonial or foreign, to have secured by their grading system a firm hold on the markets of this country, and they have done it by first of all making a careful study of the requirements of the people who consume the goods, and then grading up to those requirements, and if we want to give to our home products—our milk, cheese, butter, eggs and bacon—the place to which by their quality they are entitled, as we must, then we must also follow their excellent example and fix a standard of quality and grade up to it.

That there are difficulties to be overcome no one will question, and not the least of these difficulties is the innate conservatism of the British producer, who likes to go on in the way he has been used to go and has small use for these new fangled notions. We are individualists, and rather proud of it, we like to play a lone hand, and “paddle our own canoe,” and it does not come easy to us to move in battalions and put confidence in other people, however capable, to manage our affairs which we have always managed ourselves, for fear we should lose something. The time has come when we must scrap some of these old time methods and even run some amount of risk, and be prepared, if necessary, to make sacrifices and think not merely of our individual interests but the larger, wider interests of the farming community of which we form part, for in that direction salvation lies. In the past, competition for pre-eminence in the production of any of our products has been between individuals, in the future the competition must be between communities: as an example, for years there has been friendly rivalry between individual makers of Cheshire cheese, each striving for pre-eminence, that has been all to the good and will continue, but that spirit of friendly rivalry must now be enlarged and the makers of Cheshire cheese must as a body, strive for a position of pre-eminence with the makers of any and every other type of cheese whether made in Britain, or any other country in the world. It might be opportune here to refer briefly to the scheme which has been established for the

grading and marketing of Cheshire cheese. It is a pioneer movement which is already being emulated in other directions and may, and it is hoped will, have far reaching effects. It started after prolonged discussion in June, 1927, and has slowly but surely established itself.

Its principal features are :—

A distinguishing mark.

A guaranteed butter-fat content.

Perfection of flavour.

Uniformity.

Better keeping properties.

A certain degree of maturity before being marketed.

The stabilisation of prices.

The success of the scheme has been up to a point entirely satisfactory. The graded cheese invariably secures a higher average price than the ungraded. It is quite a common experience for buyers to ask for graded cheese, and to regard the fact that it bears the Federation Trade Mark as a sufficient guarantee of its quality.

It has raised the market price of the whole product, graded and ungraded. It has discouraged the making and marketing of immature cheese which, if persisted in, bade fair to ruin the reputation of the whole product. The progress of the scheme has been seriously retarded by the fact that a large percentage of the best makers have so far held aloof. This is partly due to the innate conservatism of farmers already referred to, and partly, however, much to be regretted—to a mean spirit on the part of producers who could easily qualify as registered makers but are content to share the advantages in price—obtained through the grading scheme—as they undoubtedly do, without contributing their fair share to its cost. When instead of hundreds, as now, thousands of the best makers become registered as members of the Cheshire Cheese Federation, the Cheshire cheese industry will flourish, as it will then be in a position to devise better methods of marketing, open up new markets, as yet scarcely touched, and secure an unassailable position, to the permanent advantage of those engaged in it.

I have referred to the foregoing at some length because it has come directly under my notice, and I know of no reason why the same principles should not be applied to other dairy products.

It is hoped that makers of other types of British cheese will now federate, grade, and market their produce on similar lines. It is interesting to note that the Cheddar cheese makers have already made some progress in that direction, but with what measure of success, I am unable to say.

Then take butter. Whether there would be the same prospect of success in the grading of British butter as with cheese is a debatable

point, with the price of milk at its present level as the raw material from which butter is made, it is doubtful whether it would be an economical proposition to manufacture butter on a large scale. On a cheesemaking farm or in a cheese factory, butter must of necessity be a by-product, while on a milk selling farm or in a milk selling factory, buttermaking is or should be non-existent, so that any scheme for the grading of British butter does not appear to offer much chance of success.

In regard to eggs, here again rapid progress has been made, and in quite a number of centres packing and grading stations have been set up, with, I believe, satisfactory results. Success should be still further assured when the long delayed and overdue Order has been made for the marking of imported eggs, in order that the consumer may know what he is buying.

May I, in conclusion, appeal to the farmer to give both sympathy and practical help along the lines I have suggested, in order that in the future no charge can be laid at the door of British Agriculture that we are not doing what we can to help ourselves.

GRADING OF IMPORTED DAIRY PRODUCE.

By CAPTAIN W. WRIGHT.

INTRODUCTION.

ALTHOUGH it is only during comparatively recent years that the grading of dairy produce has come into general use, yet, if my information is correct, the practise of grading butter is not by any means a recent innovation, because it is on record that the traders of Cork instituted in 1769, a system of inspection, weighing, and grading of butter in the Cork butter market; in this direction the following details may prove of rather more than passing interest:—

“In the year 1769 a committee of merchants was constituted, the merchants of Cork having held a public meeting at which it was decided to elect from their body annually, 21 members—14 of whom were to be exporters of the different trades, and seven from the butter merchants—to constitute themselves as the Cork Committee of Merchants, so as to devise means for the better conduct of the city. One of the conditions for membership of the Committee was that each man should have sufficient financial interest in the business to justify public opinion on any statement he made regarding that business. This Committee formed certain rules and regulations, with penalties attached for their breach, to which all members bound themselves in writing. With the tacit consent of the Weighmasters, and also of the then Corporation, they employed and paid a staff of inspectors of butter and other officials to assist the Weighmasters.

“Prior to 1769 the traders of Cork were compelled to have their merchandise weighed by Weighmasters, appointed by the Mayor under the Statute of Queen Anne, which gave power to the Weighmasters to decide whether the goods presented for weighing were of merchantable quality or not. Even in those early days from records it is apparent that, notwithstanding great difficulties, a large lucrative trade was done from this port with Spain and the West Indies. As far as we can judge, these Weighmasters placed on each package of butter a mark or brand, indicating their approval of the contents, and the fees charged by these Weighmasters were their only payment for services rendered. By this it would seem to indicate that the Weighmasters were also the butter Graders of their day.

“Under the Act of George III, in 1772, the Mayor and Council were empowered to elect twelve citizens, who were called the

'Markets Jury,' to inspect the goods then brought to the Weighmasters, who had erected their scales (their own property) one at the south side and one at the north side, which were then practically open yards. These juries, or any of them, had power to bring the owners of inferior goods before the Mayor, who had power to inflict penalties for such conduct as well as to confiscate the said goods. It is understood that under the Act of 1772, all persons bringing butter into Cork were compelled to take their butter to the Weighmasters to be weighed and inspected. The first act of the Committee of merchants was to grade the butter into three qualities, and, not having any legal power to do so, they devised a means of adding to the existing brand of the Weighmasters the figures 1, 2 and 3, so as to indicate the qualities of the butter examined."

Branding irons were also in use for the marking of firkins of butter inspected according to their grade. It is the writer's privilege to have in his possession two examples of these old grading irons which, I believe, were in use during the period referred to in the foregoing paragraphs.

GRADING OF IMPORTED DAIRY PRODUCE.

Probably at no time in the history of the world's dairying has greater effort been made by dairy exporting countries than is the case to-day to improve the quality of their dairy produce on the world's markets: one cannot help being much impressed by the efforts that are being made, and also the progress that has taken place even in those countries that have only at a comparatively recent date, organised a grading system for their dairy produce. It is patent that it is at last fully appreciated by all that for any country to market its dairy products successfully a high standard of quality must be aimed at, and what, perhaps, has proved of most value in this connection is the establishment of efficient grading and instructional systems in each of the various countries interested. The grading of dairy produce has been practised in some countries, particularly New Zealand, for a number of years, and other countries watching the advance made in this progressive movement have gradually awakened to the necessity of evolving some such system suitable for the requirements of their own country.

The systems of grading adopted by the different dairying countries in the world are not all worked along the same lines. For instance, New Zealand, Australia, Canada, United States, Finland and Russia have adopted a scoring system aiming at 100 per cent. perfection—or, in other words, using a maximum of 100 points as a total for the scoring of the various characteristics of the butter or cheese, as the case may be. Some countries have adopted a somewhat different system to this—a system of surprise inspection at varying intervals: these countries are Denmark, Northern Ireland and the Irish Free State, while Sweden, Latvia, Lithuania, and Poland, I understand,

work along somewhat similar lines. With reference to these surprise inspections, these may provide useful data up to a certain point, but I am of the opinion that such systems should be looked upon only as a temporary expedient; my own observations and experience are to the effect that this method is not as efficient, nor as beneficial, as a properly constituted grading system. Argentina is now considering the question of the establishment of a grading system suitable for their requirements, but in that country at the present time the grading of butter for export is optional on the part of those engaged in the manufacturing side of the business.

Another system in vogue is that in the case of butter from the Ukraine, which is graded when it reaches the London market. Although this system of market grading is, doubtless, of some use, I contend, unreservedly that it is much better for butter to be graded in the country where it is made, as it is then possible to advise butter makers of faults in their produce a day or two after manufacture, and, therefore, defects in the butter can be remedied straight away, and the necessary improvement in quality brought about with the least possible loss of time: the same also applies to the manufacture of cheese.

To obtain the best results from a grading system, the work of grading must be carried out in a thorough and efficient manner, and should be backed up by an expert instructional system, embracing not only the grading staff, but also an instructional staff whose duty it is to visit the various creameries and factories.

In the case of New Zealand, the expert farm and dairy instructors have likewise proved of great value and assistance in eliminating defects of quality through personal examinations of milking sheds, and at the same time they are able to give instructive advice to the farmers interested. These men are the connecting link between the dairy farmers and the dairy companies to whom the raw material is forwarded for the manufacture of either butter or cheese. This branch of dairy instruction is not yet general in New Zealand, but it is anticipated that in the not distant future it will become permanent and national in character. It can be taken as being absolutely essential, that to arrive at the highest standard of quality in all classes of dairy products, the raw material from which the produce is manufactured must be of unimpeachable quality, and this can only be brought about where there is expert control and instruction at all stages right from the farm to the finished article. Such a system entails the supervision of cow-houses, cooling rooms, and all other matters incidental to cleanliness and sanitation, including strict attention to milking machines where these are in use. If the ideal is to be reached in this respect, and a high standard of proficiency maintained, it is advisable that practical experts should be available to go to the assistance of those who are having trouble with their milk or cream supplies. In countries where home-separators and machine-milkers are in use, this is more

than ever essential, owing to the danger of the contamination of milk through the use of machines that have not been properly cleansed and sterilised. A general oversight on the upkeep and cleanliness of all utensils and plant used in the production of milk and cream for the manufacture of milk products is essential if the best results are to be obtained. It is, therefore, necessary to have an organisation for such control and supervision: this organisation (which might aptly be called a Dairy Division) must possess men who are competent to act as advisers and instructors to all those who are engaged in dairying in whatsoever country they may be located.

Just to give some idea as to how such a scheme could be worked, I would like to give my readers a brief description of the work of the Dairy Division of the New Zealand Department of Agriculture—of which I am proud to have been a member for a number of years, during which time I have had the opportunity of watching closely the working of what, I hope I may be pardoned for stating, is, in my opinion, the most complete and efficient system of its kind extant to-day.

The control of the Dairy Division is in the hands of a director, who controls all branches of work where instruction and advice in dairying are concerned, and his staff is made up of dairy produce graders, butter and cheese instructors, cream graders, farm dairy instructors, C.O.R. herd testers (who are the official recorders) and a large staff of analysts, who are required for the examination of every churning of butter before it is allowed to be exported. In addition to the technical oversight, there have recently been appointed a bacteriologist and a chemist, both of whom are engaged in dairy research and come under the control of the director of the Dairy Division. These two appointments are additional to, but separate from the actual staff, of the Massey Agricultural College, which is situated at Palmerston North, New Zealand.

Supervision of the condition and quality of New Zealand butter and cheese does not end at that point, however, because for a number of years past, an inspector has been stationed in the United Kingdom to investigate complaints and report upon the quality of dairy produce generally as it is seen on the home markets. This work has developed to such an extent that assistance has been found to be necessary: this is due to the increased production that has been going on steadily for many years in the Dominion, and which, of course, has meant an increase in the quantity of dairy produce exported.

Dairying in New Zealand is, with few exceptions, wholly co-operative so far as manufacture is concerned, and for that reason it has been necessary to erect butter and cheese factories in which large quantities of butter and cheese can be manufactured. At the same time, this method enables manufacturing costs to be kept at the lowest possible level. The New Zealand factories are well built and

fitted with up-to-date machinery. Dairy companies have no compunction in scrapping any section of the plant that may have become obsolete and replace it with more up-to-date machinery that will enable the produce to be manufactured and handled more efficiently and, perhaps, at less cost.

The position of the Dairy Division is strengthened by the Dairy Act of 1908 (being a consolidation of previous Acts with subsequent Amendments) and Amendments to date, so that it is possible to keep a complete check on the manufacture and handling of dairy produce right through to the London market. The Dairy Act and Regulations have made it compulsory that all dairy produce must be graded before export. To enable this to be done, makers are required to put index figures on all boxes of butter and all crates of cheese, so that the grading work can be efficiently carried out. There are grading rooms, and the necessary offices for the grading, handling, and storage of dairy products at all the approved cold stores in the Dominion. On arrival of consignments at the cold stores for export, one box of butter out of every churning and one crate of cheese out of every vat of milk is set aside for grading; the maximum scores are as follows:—

<i>Creamery Butter.</i>				<i>Factory Cheese.</i>			
Flavour ...	...	...	50	Flavour ...	...	...	50
Body, moisture and texture ...	...	...	25	Body, moisture and texture ...	...	...	30
Colour ...	...	...	10	Colour ...	...	...	15
Salt ...	...	...	10	Finish ...	...	...	5
Finish ...	...	...	5				

Until two years ago the quality of the butter and cheese was divided into three grades—1st, 2nd, and 3rd—but an alteration has since been made, with the result that all butter and cheese scoring 93 points and over is classified as “Finest,” that scoring from 90 to 92½ points as 1st grade, and any scoring under 90 points as 2nd grade.

The following is a brief summary of the percentages of butter and cheese graded in the different classes during the year ending July 31st, 1928:—

<i>Creamery Butter.</i>			<i>Factory Cheese.</i>		
Finest ...	...	69·77%	Finest ...	...	30·55%
1st grade ...	...	27·72%	1st grade ...	...	66·96%
Below 1st grade ...	...	2·51%	Below 1st grade ...	...	2·49%

The weights of 5 per cent. of all consignments of butter and cheese are checked by the graders, particulars of which are included in the grade certificate that is supplied to all who are directly interested in any particular consignment.

Samples are also taken from every churning for analyses for water content. After these details have been carried out the butter is placed in cold storage, and the cheese into cool storage, to await shipment.

The Regulations make it compulsory that all butter must be four clear days in the freezer, and the cheese four clear days in cool store, before being shipped.

The butter and cheese instructors are morally responsible for the quality of the produce manufactured each in his particular district. These instructors are kept in close touch with the grading results of the produce of factories under their control, and when any falling away in quality takes place they are available to assist butter and cheese makers out of their difficulties.

This brief description of the grading system as it has been adopted by the Dominion of New Zealand, and the working of which has proved an invaluable aid in the maintenance and, where necessary, improvement of quality, will give my readers some idea of the value, both from the manufacturing as well as the commercial side, of a comprehensive system of inspection and of grading dairy produce. Dairy produce graders and instructors act as judges of the dairy produce at all agriculture and dairy shows in the Dominion.

It might reasonably be asked by my readers how such a system is viewed by the dairy farmers of the Dominion. I would, therefore, just like to say that the development that has taken place in the improvement of the quality of New Zealand dairy produce has been made possible by the good will of dairy farmers, directors of dairy factories and factory managers, who have all given their whole-hearted approval and loyal support to the progressive policy of the Dairy Division. As a result the dairy industry of New Zealand may now be said to be on a sound and solid footing.

At the inception of any new system, or organisation, there are bound to be mistakes made of one kind or another, but these mistakes can be avoided as time goes on, and will eventually disappear with the additional knowledge gained after more lengthy experience in its working.

For a grader of dairy produce to give the best results in the working of a system over which he may have control, it is necessary that he should be a man of undoubted practical knowledge in the work of manufacture, and, at the same time, a good judge of the quality and character of the products which come under his notice. It is admitted that graders gain experience in their judging perceptions by being continually engaged in this particular branch of dairying; it is by the grading, or judging, of numerous brands of butter and cheese of various qualities that he is enabled to maintain his standard of quality, and thus by constant practice become a specialist in the judging of dairy produce. Men of such experience and judgment have proved to be a sure safeguard against material falling away in quality owing to the timely advice, received by makers at an early date after manufacture, of the quality of consignments that have gone forward to the grading stores. It is compulsory for grade stamp marks, in keeping

with the quality at the time of grading, to be placed on every box of butter and every crate of cheese in indelible ink after grading. By this means buyers are protected at the market end of the business, and, in the case of produce from New Zealand, should any buyer have occasion to question the quality of the goods he may be handling on home markets, the services of the Inspectors of Dairy Products are available to investigate his complaint and act according to the result of investigations.

In passing, I would like to point out that Grade Certificates for New Zealand dairy produce are accepted as a trade document by the London Provision Exchange so far as quality and weights are concerned. This indicates that buyers have sufficient confidence in the quality of the produce of a country where grading is efficiently carried out to make their purchases without first of all making a personal examination of the quality as was the practice some years ago—the name of the brand and the grade stamp mark being enough to satisfy the majority of the buyers in this country as to the quality of New Zealand butter and cheese that they are buying, and, naturally, as a result of this growing confidence on the part of buyers a considerable saving in both time and money has been effected.

A grading system to be of the best value to all must be effective in every detail, and free from dual control so far as individuals or other bodies are concerned. As the result of a long and intimate connection in the manufacture of butter and cheese, and also with the grading of dairy produce and instruction work, I feel convinced that the most satisfactory body to handle such a system in any country is the Government of the country, working through its properly appointed Agriculture Department, of which a Dairy Department, or Division, is a branch. The early advice that makers receive from the graders, when the grading is done at regular and frequent intervals in the country of origin, is invaluable to the manufacturer and his staff. By such means a great majority of the troubles that may have developed within a short period can be checked, and invariably prevented in the future, without undue loss of time, thus avoiding serious financial loss to all parties concerned; whereas, if the evil was not discovered until the goods had reached their market, which is possibly several weeks distant from the country of production, there is the great possibility that the trouble would have been gradually growing more pronounced with resultant loss of quality extending over a commensurate period. For that reason, a grading system such as has been described becomes a strong bulwark of protection to the welfare of the industry working along these lines, because not only does the grader protect the farmer and manufacturer from loss, but also the interests of those who buy such produce when it reaches its market. There is no doubt that the provision trade of this country to-day expect, and one might say, demand, a produce of a uniformly high standard

of quality, characteristic of its true type, and reliable as to all other features such as moisture content of butter, fat content in cheese, &c.

In conclusion, I would stress this point that it must be realised that grading is only one link in the chain of supervision and instruction, and best results are only obtained when it is worked in conjunction with an efficient staff of instructors in all branches of dairying, it being then possible to effect early improvement in the quality of any produce that has been found to be of a low standard at the grading stores.

Does not the foregoing suggest that it should be possible to develop some such system of grading and instruction work in the dairy industry of the British Isles? For a commencement I would suggest that a beginning could be made on the farms, where the bulk of the English cheeses are made. Why not make a start by bringing all cow-houses and environment up to the standard required for the production of Grade "A" milk? If this could be done it would rapidly be reflected, in my opinion, in the improved quality of the butter and cheese manufactured.

There is a saying that "The strength of a chain is only that of its weakest link"—a saying that is very applicable to dairying to-day. Should not this be an incentive to the dairymen of the British Empire to obliterate all weak points and undesirable features in our future dairying methods? If this were done it would eventually bring financial success to all engaged in this most important branch of industry—an industry that is possibly one of the oldest in the world.

THE MANUFACTURE OF ICE CREAM IN A SMALL COMMERCIAL DAIRY.

By R. W. CHAMPION, N.D.D., B.D.F.D.

INTRODUCTION.

IN view of the increasing popularity of ice cream with the general public, and the impetus given to the trade by the formation, in this country in 1926, of the Ice Cream Association, there appears to be a fresh field rapidly opening for the profitable utilisation of surplus milk and milk products by converting them into ice cream.

As a feeling seems to be arising that only large firms or combines with complete and costly machinery and equipment can economically and profitably produce and distribute ice cream, the writer proposes in the following paper to relate his experiences of ice cream manufacture in a small commercial dairy, where he assisted in the manufacture of this product, and to show that there is no reason why a small dairyman may not introduce ice cream manufacture as a profitable side line to his business.

It is proposed to give a more or less methodical description of the methods employed at the particular dairy under consideration, with occasional remarks on the individual processes involved.

THE DAIRY.

It is not necessary for the purpose of this paper to disclose the name of the dairy in which the writer was employed. It was situated at a popular south coast seaside resort, and was under private ownership and management. At this dairy from 50 to 80 gallons of Grade A milk were bottled and retailed daily; in addition to the sale of cream, butter and eggs, ice cream was manufactured and sold, both wholesale and retail, during the period from early April until early in October.

THE MACHINERY.

The machinery involved in the ice cream making included a pasteuriser, homogeniser, ice crusher, brine pump, vertical boiler, and an Emery Thomson horizontal freezer. The refrigerating plant and cold store was controlled by a Graham Enoch compressor. Electric power was used throughout, as the steam generated by the boiler was used solely for heating and sterilising purposes.

DEFINITION OF ICE CREAM.

An American definition is as follows :—

Ice cream is a frozen compound of dairy products, gelatine and sugar, varied as to kind and proportion of ingredients within the limits established by custom and usage.

CONSTITUENTS INVOLVED.

Butter Fat.—Is the most important constituent of ice cream on account of its dietetic properties, and its influence on the quality of the final product. It must be pure and clean, and may be supplied by the addition of cream, unsalted butter or butter oil. In the particular dairy under consideration, the use of cream containing 50 per cent. fat gave excellent results. A cream of this quality produces butter fat in excellent condition for incorporation with the mix, and gives a finished product which is noticeably superior to that obtained where the use of butter or re-constituted cream is resorted to.

Sugar.—The next ingredient in order of importance is sweetening ; this was supplied by the use of ordinary cane sugar. The sugar content of ice cream has a considerable influence on flavour, for a low sugar content gives a flat flavour, while excess gives a sickly flavour. The presence of sugar in super-saturated solution gives rise on keeping, to the formation of crystals, with a resulting gritty ice cream. Excess of sugar also renders freezing and hardening difficult. The amount of sugar used should be between 12 to 15 per cent.

Milk Solids.—In order to give the ice cream the proper texture and body and to raise the solids-not-fat content, skim milk powder was used. The brand used was known as "Anchor Brand," and was supplied by the New Zealand Co-operative Company. An advantage in using skim milk powder as a filler, is that it may be bought in bulk and stored. The usual quantity used was 10-12 per cent. American experts now recommend that this quantity be increased, but 15 per cent. is the maximum that can be used without producing a sandy ice cream.

Stabiliser.—Some form of stabiliser is necessary in order to give body and smoothness and to prevent large ice crystals forming. Gelatine of the very best quality was always used, it has a considerable food value, and increases the digestibility of the product. The quantity used in all mixes was .5 per cent., if this amount be exceeded the ice cream does not melt readily and appears artificial to the consumer.

Flavour.—This is an important item ; the use of cheap flavouring is bad policy. It was found that strawberry and vanilla were by far the most popular flavours. Best proprietary brands of synthetic fruit flavours were used for all grades of ice cream made at the dairy. The proportion used varied, as it was added to meet the "taste" desired ; .25 per cent. would be a probable average.

MIXING.

Ice cream was not made every day, but batches of 60-100 gallons of mix, yielding 114-190 gallons of ice cream, were made at frequent intervals, as required.

On arrival at the dairy the milk intended for ice cream making was

distributed in a series of 17-gallon churns, about 12 gallons being put in each. The skim milk powder was then weighed out, added to the milk, and thoroughly mixed in with a plunger. After about half-an-hour all the skim milk powder had dissolved.

PASTEURISATION.

The cold mix was then transferred to the pasteuriser and heat gradually applied. Before the temperature of the mix reached 110° F. the requisite amount of sugar was added. The gelatine required was first dissolved in hot water and then added to the mix at a temperature of 120° F., in this way the formation of sticky gelatinous lumps (liable to choke up the homogeniser) was prevented. During the mixing process the mix was kept continually agitated until it reached a temperature of 145° F. It was maintained at this temperature for 30 minutes, and then cooled to 110° F. by means of cold water circulated through the jacket of the pasteuriser. At this temperature the mix is ready to pass through the homogeniser.

HOMOGENISATION.

Is carried out in order :—

- (1) To increase the viscosity of the mix.
- (2) To give smoothness and uniformity.
- (3) To render possible the use of ingredients that would otherwise cause lumpy texture.
- (4) To assist in getting the required over-run. The mix was pumped through the homogeniser at about 2,500 lbs. pressure, the higher the acidity of the mix, the lower the pressure required. An acidity of .25 per cent. should not be exceeded if the best flavour is to be obtained.

COOLING.

From the homogeniser the mix was passed over a brine cooler and reduced in temperature to 36–40° F.

Ageing.—After cooling, the mix was collected in churns and removed to the cold store, where it remained from 24–48 hours to “age.” A little rennet may be added to assist in the thickening process. Considerable importance was at one time attached to the viscosity developed during the ageing process, but this is apparently less important than was supposed.

In the course of a paper on “The Newer Phases of Processing Ice Cream,” which was read at the World’s Dairy Congress, 1928; G. D. Turnbow, Dairy Division, University of California, states :—

“The true viscosity, or the viscosity of the fresh mix, is important. The colloidal, or apparent viscosity developed during

the ageing period is secondary, and is destroyed shortly after the mix enters the freezer. The basic viscosity, when reached in the freezer is apparently identical to that of the mix before ageing."

According to the same authority, a change occurs in the protein during the ageing process, and it is brought about by the action of certain salts normal to milk. It is further stated that, by the proper handling of the mix, these changes can be effected almost instantaneously. The process of ice cream making may then be made a continuous one, producing a fresh product with a low bacterial content.

FREEZING.

After ageing, the mix is ready to be frozen. It was found that the size of the "batch" added to the freezer materially influenced the over-run obtained. In order to get a 90 per cent. over-run the freezer needed to be slightly more than half filled. The temperature of the brine during freezing needed to be between 0-8° F., and the aim was to get the batch frozen in 10-15 minutes. To get a smooth texture, freezing must be carried out rapidly. The time taken to freeze the ice cream is inversely proportional to the speed of the beater; it is essential that the beater blades are kept sharp. An average speed of operation is 200 r.p.m. The lower the temperature of the brine, the faster the speed required.

OVER-RUN.

The over-run aimed at was 90 per cent., care was taken to achieve this as nearly as possible. Too low an over-run means a heavy, costly ice cream; excess over-run gives a fluffy, brittle ice cream that shrinks excessively. The swell or over-run is made up of air, and equals the excess of ice cream over the mix from which it was made.

Suppose 1 gallon of mix weighed 9.25 lbs. and that 1 gallon of ice cream weighed 5 lbs., then the over-run would be 85 per cent.

HARDENING.

When ready to draw from the freezer, the ice cream was still in a semi-liquid state. That required for the wholesale trade was run off into containers, ranging in size from 2-5 gallons capacity. The ice cream required for the retail trade was drawn off in jugs, and transferred into small waxed cups and boxes, arranged on trays. When filled, the trays and containers were removed to the hardening room, and kept at a temperature below zero for from 12-24 hours, by which time they had frozen hard and were ready for sale. The hardening room temperature was controlled by an Enoch's compressor. It was occasionally necessary to scrape the frost and snow off the coils which passed through this room, or a great loss of efficiency in cooling occurred.

DEMAND.

Being at a seaside resort it was found that during the summer season the demand for ice cream was fairly consistent, though it naturally fluctuated somewhat with the variability of weather conditions. It was found that, as a general rule, the public preferred a rich ice cream containing 12-15 per cent. butter fat, 9-10 per cent. solids-not-fat, 15 per cent. sugar and .5 per cent. gelatine, and that they were prepared to pay for this rather than buy a poorer quality ice at a cheaper rate.

However, in order to compete with Italian vendors and to supply a cheap ice as was in demand on the beach, a poorer grade of ice cream, containing only 5-6 per cent. butter fat, was also made. In order to facilitate the distribution of ices on the beach, a "kiosk" was rented, and ices and sweets sold over the counter. A soda fountain was later introduced, and proved quite profitable, as the demand for iced drinks was considerable.

DISTRIBUTION.

(a) *Wholesale*.—The cans containing the ice cream intended for wholesale delivery were, as required, placed in wooden tubs and well packed round with ice and salt. Care was always exercised that no salt found its way into the ice cream, as salt immediately spoils the flavour and body of this class of product. These cans and tubs were ultimately delivered by the milk van on its return to the dairy, at the end of the morning milk round.

(b) *Retail*.—The retail distribution was carried out by three men with jacketed cabinet tricycles. These men came at 9 a.m. and broke up ice, with which they packed their cabinets; they then cleaned up their tricycles, and left with a load of ice cream at 10.30 a.m., returning to "cash in" in the evening at 8 p.m.

They received a standing wage of 20s. per week, and were given 2s. on each pound's worth of sales. Average takings would be 30s. per man daily, but in very hot weather this amount might easily be trebled. The type of labour available for this work was unreliable and inefficient, with few exceptions.

The cups and cartons of ice cream, a certain number at each price, varying from 2d. to 1s., were issued to each man, and signed for by him when received. On "cashing in" the ice cream unsold was deducted from the amount originally issued. The balance represented the value of sales for the day, and the men were expected to produce cash to cover the amount due. This system of checking had a flaw, in that, by charging more for the ice cream than the rate at which it was entered in their books, the men were able to pocket the excess themselves, with little fear of being detected. To overcome this difficulty, the price of each carton of ice cream was plainly marked on

the side or top of the container before its issue for distribution. Thus, the public were able to see the actual price they were expected to pay for any particular size or shape of the product.

TYPICAL MIXES USED.

All mixes were calculated on 100 lbs., and quantities were proportionately increased or decreased as desired.

Mix "A."

To supply approximately :—

per cent.						
11·00	...	...	...	...	...	Butter Fat.
12·75	...	...	...	...	...	Sugar.
10·50	...	...	...	...	...	Serum Solids.
00·50	...	...	...	...	...	Gelatine.
00·25	...	...	...	...	...	Flavour.

The following 100-lb. mix complies with the composition desired :—

						lbs.
Cream (50 per cent. fat)	...	...	...	...	...	16·50
Milk	...	...	...	...	...	66·00
Skim Milk Powder...	...	...	...	...	...	04·00
Sugar	...	...	...	...	...	12·75
Flavour	...	...	...	...	...	00·25
Gelatine	...	...	...	...	...	00·50
						<hr/> 100·00 <hr/>

Mix "B."

To supply approximately :—

						per cent.
Butter Fat	...	...	...	...	...	00·60
Sugar	...	...	...	...	...	12·50
Serum Solids	...	...	...	...	...	12·00
Gelatine	...	...	...	...	...	00·50
Flavour	...	...	...	...	...	00·25

This is complied with in the following 100-lb. mix :—

						lbs.
Cream (50 per cent.)	...	...	...	...	...	07·10
Milk (3·6 per cent.)	...	...	...	...	...	74·50
Skim Milk Powder...	...	...	...	...	...	05·15
Sugar	...	...	...	...	...	12·50
Gelatine	...	...	...	...	...	00·50
Flavour	...	...	...	...	...	00·25
						<hr/> 100·00 <hr/>

Approximate Cost of Ingredients of Mix "B."

lbs.		s.	d.
74.50	milk at 1s. 2d. per gallon ...	8	3½
07.10	cream at 13s. 6d. per gallon ...	10	1
05.15	powder at 6d. per lb. ...	2	7
12.50	sugar at 3d. per lb. ...	3	1½
00.50	gelatine at 1s. 4d. per lb. ...	0	8
00.25	flavour at 17s. 6d. per lb. ...	4	4½
<hr/> 100.00 <hr/>		<hr/> £1 9 1½ <hr/>	

Assuming each gallon of mix to have an over-run of 90 per cent., then the actual cost of ingredients per gallon of ice cream made from Mix "B" would be approximately 1s. 9d. The cost of ingredients per gallon of ice cream made from Mix "A" works out at about 2s. 6d. per gallon, and contains 11 per cent. butter fat as against the 6 per cent. fat in Mix "B."

RETURNS.

It was found that the average returns from the retail sale of 1 gallon of the poorer grade ice cream was 13s. 6d. to 16s. per gallon, and that the better quality returned from 16s. to £1 per gallon. It is thus obvious that scope is allowed for a generous profit. Of course, before the actual profit could be calculated, allowance must be made for rent, labour, interest on capital, cost of power, depreciation on machinery, &c., but it must be borne in mind that most of these charges have to be shared by the milk business, of which the ice cream manufacture forms only a seasonal but profitable side line. Moreover, the pasteuriser, cooler, boiler and cold store were used more for the milk branch of the business than for ice cream manufacture. Thus, costs under these headings against the ice cream manufacture are not nearly so heavy as might at first be supposed.

CONCLUSION.

The writer does not claim originality for this paper, having merely stated the methods employed in a small dairy, in the endeavour to make his point, that the manufacture of ice cream is an economic proposition for the small dairyman, as well as for large firms and combines.

Too often the small manufacturer makes his mix by guess work, with the result that his product is very variable, and does not meet public favour, *what the public demands before everything is uniformity*. He is often deterred from buying a homogeniser because the first cost is too great, as a consequence, if he uses butter or condensed milk to supply the fat content in his ice cream, the texture is liable to be poor. In cases where a homogeniser is not used, it is highly advisable that cream be the medium that supplies the desired fat content, as it gives an ice of satisfactory body and texture, quite equal to the best homogenised product.

In the commercial field, equipment varies with the size of the business. Small manufacturers use ice and salt for freezing and hardening, and have little equipment beyond a freezer and hardening cabinet, yet these small manufacturers are still able to produce a marketable product that encounters a ready demand and sale.

Before laying out capital on expensive plant, it is essential that the sale of the product is assured and sufficient to justify the expenditure.

For the small manufacturer, using improvised utensils and a hand freezer, capable of dealing with 1 gallon of mix at a time, the following mix is suitable:—

3 pints good quality cream.
4 pints separated milk.
 $1\frac{3}{4}$ lbs. of sugar.
 $\frac{3}{4}$ ozs. of gelatine.
13 ozs. of skim milk powder.

Flavour to taste, made up to 40 ozs. with water. This mix gives a rich ice cream, suitable for a good class trade.

METHOD.

Weigh out the sugar and gelatine and mix well together in a pan. Next weigh the milk powder and stir well into the above. Next measure the cream and milk into a pail; add the mixture of solids, well stir. Heat the whole to 145° F. by standing the pail in hot water, continue stirring. Maintain at this temperature for 30 minutes. Then cool to as low a temperature as possible. Add 1 c.c. of rennet, and leave in a cool place to age for from 12-24 hours.

A very palatable flavour for the above mix may be made by taking four ripe bananas and, after skinning same, beating them into a smooth mass, which can be swilled into the mix with a little water and well stirred in. When convenient, place the mix in the freezer and whisk evenly and briskly for 15 minutes. Finally, remove to a hardening cabinet or pack in ice and salt until ready for sale.

One point in ice cream manufacture is of supreme importance to both large and small manufacturers. It is, "*That quality be maintained*" in order that the consumption of the product be increased as much in the future as it has done in the past.

Finally, the writer is of the opinion that the sooner official stimulus is given to the production of high grade ice cream

- (1) By the adoption of a Government standard for this class of product;
 - (2) By instituting classes for ice cream at the Dairy Show, and creating the competitive spirit;
- the better it will be for the Dairy Industry at large.

THE ORGANISATION, MANAGEMENT AND COST COMPARISON OF FARMERS' CO-OPERATIVE DAIRIES.

By L. J. LORD, C.D.A. (WYE).

SOCIETIES of dairy farmers, formed for the purpose of co-operation in the collection and sale of milk on behalf of the members, and, possibly, the purchase and distribution of feeding stuffs, manures, and other farm requirements, are frequently being advocated. Especially is this so in times of tension, when market prices become adjusted to figures that appear unduly hard upon the farmer's pocket.

Obviously, the incentive to such action is the hope of securing a better price for the produce of the farm, and, in regard to purchases, the advantage of being able to buy in bulk at easier prices or to obtain smaller quantities at a convenient place and time. To some members there is also a distinct advantage in being able to run a "contra" account against deliveries of milk, with a regular settlement and no risk of bad debts.

Of course, it is also intended that the marginal profits of the concern shall exceed the charges; that the business shall grow till it is established as the recognised medium of disposal for milk, and, perhaps, other produce, and through which supplies may be procured for carrying on the more general activities of the farm.

The prospects of commercial success, especially in the early stages, depend to a marked extent upon the loyalty of members, but there are certain fundamental points to be considered in deciding if the circumstances are favourable to the establishment of such a centre for co-operative trading.

The productive field for milk has to be surveyed. Supplies from a few large farms form a very desirable nucleus, as it must be remembered that farm dairies producing a large daily quantity of milk are much sought after by buyers, who are prepared to pay a slightly higher price, sometimes a substantially higher price, per gallon. It is a little difficult in co-operative practice to reconcile this definitely higher market value with supplies from a large number of small farms or grass holdings in a district where the latter predominate. The small farms, on the whole, will derive most benefit from the establishment of a central dépôt, and will probably, in the long run, give a fuller measure of support to the business, which, if properly administered and managed, should become a matter of personal interest, as well as a source of mutual and individual benefit.

Next, one realises that the organisation of such a place covers the selection, or building, of suitable premises, and the appointment of a manager by the Board of Organisers, or, perhaps later, by the Committee of Management.

The coupling together of the above points, implying they may be of equal importance, certainly depends upon the extent as well as the character of the business to be dealt with. If it is to be mainly concerned with the supply of "agricultural stores" to the farmer, then it is very probable that premises already in existence will be found suitable for the purpose, while, if it covers dealing with considerable quantities of milk at any season of the year, it indicates that special buildings, or at least existing buildings reconstructed or fitted up in a manner suitable to the work are necessary. The source, abundance and arrangements for water supply, is also a matter of high importance for early deliberation.

Similar considerations apply to the appointment of a man to manage the concern.

It may be sufficient to put in charge a good storesman with some little knowledge of booking. His supplies might be regulated under the supervision of the Chairman of Committee, or the occasional attention of a part-time Secretary, but rarely can such a method of administration be applied with a full measure of success.

For a large well-equipped dairy that has to deal with several hundreds of gallons of milk daily a technical man, well-experienced in the milk trade and the manufacture of milk products, is advisable. A man whose knowledge and opinion is going to be of value to his employers and who is worth correspondingly good money. Where considerable technical knowledge is required there is often great advantage in getting such a man engaged early in the proceedings. His advice regarding the suitability, reconstruction or planning of a building is valuable and not unprofitable. Architects cannot be familiar with the technical requirements of every business for which they are called upon to design buildings, and even they must needs consult somebody to avoid errors that may lead to economic waste when applied to the particular requirements of a specialised industry. Then, again, the type and arrangement of plant and machinery to be installed is a point upon which the practical opinion of the man who is to be held responsible for the work they do should be worth having, in conjunction with that of the firm who are to be entrusted with the instalment and fitting up of such appliances.

Similarly, if the business contemplated is to buy the produce of the farms, hay, corn, or potatoes, as the case may be, then the manager requires to be a man who is in some degree familiar with these matters. For a Committee of Management, or some of the members appointed for the purpose, to have to decide upon a scale of prices, is not a very

satisfactory way of trying to deal with such matters. It is a much more difficult subject than the regulation of milk purchase prices over a stated period of supply. Such details in other matters are better left to the control of one man, and it should pay to engage a man who has already a sound knowledge of the business and sense enough to know his own limitations, so that he is not above referring to his Chairman, at particular times, especially when a question of policy may have arisen in the course of his duties. When a man is trusted to rely upon his own judgment in the purchase and sale of goods, he realises that his employers are entitled to reports of progress in which the details show that they can have confidence in his management.

Upon the comparative importance of the two departments—milk or general produce—or whether one or the other alone is to be the “raison d’être” of the business, lies the decision of the kind of knowledgeable man to employ. The additional business of supplying feeding-stuffs, manures and other requirements, is of a less technical nature and concerns matters more adjustable by decisions of the Board, such as the margin of profit to be charged over market quotations and the balance of stocks to be carried, &c., but these matters require particular and individual attention, especially when large quantities are being dealt with in the face of market fluctuations, so that rules and regulations must not be too restrictive if trade is to be active and progressive.

After the financial status of the new concern is decided upon and assured, sound administration appears to have its foundation in this choice of an educated man well-experienced in that branch of the work which is likely to be the most important, and so provided for that he is sufficiently free of personal duties to be able to give thoughtful supervision to the work of his assistants in departments where his personal skill or particular knowledge does not directly apply. The forethought of a general manager, expressed in consistent effort towards linking up the work of various departments, and seeing that they co-operate in the economising of labour and other working expenses, is a telling item in the long run.

A manager also requires to be sufficiently conversant with book-keeping to direct a fairly exhaustive system of accounts; that is, exhaustive in the sense that all important details bearing upon the conduct of the business and the balancing of income and outgo in materials of trade, are readily available for examination at committee meetings. It is possible that the provision for book-keeping expenses will not be enough to pay for an experienced clerk, but primary book entries may be made by any member of the staff concerned in the transfer of milk or other goods, and subsequent entries by one entrusted with the books. Further consideration of account keeping is dealt with later, where the kind of system desirable is indicated.

THE MILK DEPÔT.

In considering the establishment of a wholesale milk depôt as the first step in co-operative enterprise among dairy farmers, it is fairly safe to assume that the purchasing price of the milk will be a matter in the hands of the committee, or possibly the one matter definitely open to full consideration of the shareholders as a corporate body. In such case, while the committee would naturally have a keen eye to the settlement at a price which would appear to leave a reasonable safe margin for covering the working and overhead expenses—and thus be forced to some extent to defend the position of the society against the more individual views of some members—the manager will feel it incumbent upon himself to get as good terms as possible for the business in his charge, and his counsel put forward on these grounds should be afforded a full hearing. At the moment he is the purchaser from the members, the committee being the Court of Arbitration, and even if his desire for a low profit-yielding price is not acceptable, there can be found terms of contract, both favourable to the business as a whole and not necessarily irksome or unprofitable to the individual members as suppliers of the milk.

As an instance of this suggestion carried into practice, witness the adjustment of terms in the National Farmers' Union milk contracts. Indeed, among smaller co-operative bodies than those of national areas, it is sometimes possible, and with due regard to the interests of the business, to so adjust prices to suit the circumstances of adjoining districts, or even of individual farms, without encroaching upon the rights of one member as compared with another.

It must be noted there are special seasons—varying somewhat according to geographical position—when the interests of members as producers of milk and the society as milk purchasers, are bound to clash. The producer wants a high price in March and April, because it costs him more to make milk after a long period of artificial feeding without grass. And the down-calving cows are coming in. The same argument applies, in rather different fashion, to late summer, when the pastures are drying, the early spring calvers are giving less milk, and more cake is required to maintain the yield.

The purchaser cannot face a high price in March and April with an easy mind, for there is too often more milk produced at that season of the year than will sell as liquid milk, and, if it has to be turned into cheese—butter is almost unthinkable—the sale price is correspondingly low.

On the other hand, the purchaser does not mind paying a higher price in late summer, for milk is in demand, and any surplus over contract sales can be disposed of at a better profit. There are also other times when the society may afford to pay a little more for extra supplies, but it depends upon the season and business connections.

For instance, for many years before the N.F.U. scheme of an "Accounting Period" came into effect and substantially altered the balance of supplies as between summer and winter, February was always a short month for milk in the north, while, just previously, that is to say for several weeks after Christmastide, it was a drug on the market.

Furthermore, October is a month when, in districts where the meadow aftermaths are ready for feeding at that time, there is a good flow of milk, but the producer likes to draw a price as good as that of the later months, though he cannot put forward so good an argument for it. Of course, one reason why the purchaser prefers a more gradual rise from summer to winter prices is that the abrupt change leads to a reduction of sales, because the consumer buys less.

A society is handicapped if it has to deal with heavy supplies in October, but if prepared to make cheese, can to some extent minimise the probable loss by making quick-ripening Christmas cheeses of the smaller kinds that are in seasonable demand at somewhat better than regular prices.

Under such considerations a milk contract would be adjusted to meet the conditions. The terms being known sufficiently well ahead to a man buying down-calving cows to supplement his own calvers, the contract would suit him nearly as well as it would the interests of the society. He finds himself a little more into pocket by so managing his affairs that a heavier supply of milk goes from his farm to the dépôt at the time when prices are good, and thus both parties to the contract are satisfied. A concrete instance of such an arrangement is seen in the following examples :—

EXAMPLES OF VARIATION IN THE PRICING OF AGREED MILK CONTRACTS.

Example No. 1.—Price agreed upon in conference as a season average price :—

For winter six months ... 16 pence per gallon.
For summer six months ... 12 " "

Suggested variation to suit both parties :—

October	...	...	16	adjusted to	...	...	15
November	...	...	16	" "	...	...	17
December	...	...	16	" "	...	...	17
January	...	...	16	" "	...	...	15
February	...	...	16	" "	...	...	17
March	...	...	16	" "	...	...	15
			96				96
			—=16				—=16
			6				6

April	12	remains at	...	12
May	12	adjusted to	...	10
June	12	" "	...	10
July	12	remains at	...	12
August... ..	12	adjusted to	...	14
September	12	" "	...	14
	<hr/>			<hr/>
	72			72
	<hr/>			<hr/>
	—=12			—=12
	6			6

The first column relating to each season represents the basic price agreed upon at the general meeting, the second shows the variation agreed upon by accommodating members to offset the risk of overloading the depôt with milk at unprofitable times. The average price remains the same over each six months. The weakness in such a bargain from the producers point of view lies in April being classed as a summer month.

Example No. 2.—Twelve months agreed at the meeting as 4 at 16*d.*, 4 at 14*d.*, 4 at 12*d.*

November	16	remains	...	16
December	16	becomes	...	17
January	16	remains	...	16
February	16	becomes	...	17
	<hr/>			<hr/>
	64			66
	<hr/>			<hr/>
March	14	remains	...	14
April	14	"	...	14
May	12	becomes	...	10
June	12	"	...	10
	<hr/>			<hr/>
	52			48
	<hr/>			<hr/>
July	12	becomes	...	13
August... ..	12	"	...	13
September	14	remains	...	14
October	14	"	...	14
	<hr/>			<hr/>
	52			54
	<hr/>			<hr/>

The first column of figures shown in each section of four months is the basic price, it being understood that the bordering months of March and April, and of September and October, are those to which the midway basic price of 14*d.* applies.

Here again it can be seen, *i.e.*, $64 + 52 + 52 = 168$, which divided by 12 equals 14*d.*, and $66 + 48 + 54$ also equals 168, thus making an average of 14*d.* per gallon over the 12 months.

In each case the adjusted price equals the basic price over the

full year, and if the spirit of co-operation is active, such adjustments to the partial advantage of both sides are looked upon as an expression of mutual help.

THE MANAGER'S DUTIES.

Here is but an incomplete synopsis of the manager's many duties ; he must exercise forethought in the handling of supplies ; study the care of machinery and its proper application to milk according to the circumstances and the need to exercise economy of power, &c., this covers the effective and safe treatment of milk in times of pressure and when conditions are adverse, as in a hot spell of sultry weather ; the allotment of sale quantities in times of shortage, and the disposal of surplus milk in the most profitable, or the least unprofitable ways ; the estimation of comparative costs ; the economical employment of labour ; the avoidance of waste and leakages of all kinds ; the building up of a regular sound business connection, and all these things in accordance with the policy laid down for him, or inferred from the deliberations of the committee, to whom he reports.

Naturally, a man well versed in the technical work of handling milk in quantity and capable of directing every detail of the enterprise in his charge, may reasonably be given a free hand in developing the business into a profit-making concern.

It will even be advisable if business increases sufficiently, to consider the policy of obtaining supplies from other than the registered members of the society, with or without restrictions as to the circumstances under which prices differing from those of the usual contracts might be paid.

The oversight of supplies, with milk sampling and testing, naturally falls to the manager, who is responsible that the output of the dépôt is in faultless condition. A properly conducted system of examination and testing of periodical and occasional samples is an important duty. His would be the decision as to whether milk coming in was fit to be treated for sale, or to be applied only to "manufacturing purposes," or, in the last resource, to be sent back to the farmer. Here comes a matter requiring some firmness and tact, for offence may easily be given, or, on the other hand, unfair practices be allowed, by one whose authority is not fully recognised.

The manager is justified in asking for the provision of properly drawn-up contracts, to be signed as between the members and the "dairy." These would cover such matters as variation in quantity, proper condition, "fit for sale," the application of "clean milk" methods on the farm, so far as the members may be agreed thereon ; in addition to the agreed prices, which should be set out in detail on each contract, particularly if there is any individual variation upon an adjustment basis.

ACCOUNT KEEPING.

The application of an effective accountancy method to co-operative dairying, albeit it should be in as simple a form as possible, is very desirable. Everyone should be assured that no leakage can occur

through neglect of booking, or lack of an easy means of checking balances at the month end.

In the first place, the quantities of milk delivered, or collected, as the case may be, require to be booked at the time in duplicate, the supplier taking the free slip, and the carbon copy remaining in the dairy book. Here is a certain means of check, in the event of error in the account when rendered at the end of the month. Similarly, for every purchase at the store should be issued a duplicate sale ticket, thus affording a reliable check if the item gets wrongly booked in the dairy accounts.

Statements of these two "contra" accounts form the basis upon which the farmer's milk cheque is written.

Of course, all these details require to be entered a second time in record form, so that for any month in question—or any day for that matter—it can be seen what quantity of milk was sent in by each and every member, and, on the other hand, exactly what amount of each kind of stores has been sold, and sales of cheese and other produce obtained from the "manufactured" milk. From this information the dairy ledger is entered up, to be balanced periodically by taking into account the entries that come from the record of cash taken, or cheques paid out.

To complete the system, the invoices of goods coming in are entered in an analysis purchase book, with the totals of the monthly milk statements. This forms a record of supplies with the purchase cost of each item, so that, when overhead charges of rent, power, labour, &c., are reckoned up, a fairly accurate cost sheet, showing the approximate profit and loss on the month's working, may be made out and submitted to the board every month. It forms a fairly sound indication of how things are going and provides a guide for work in the future. Such cost sheets can be made exceedingly useful, if the details are carefully considered and proved to be reasonably applicable to the facts. In this way may be checked the loss in measure between purchase and sale, from cooling, pasteurising, bottling and spillage of milk; yield of cream, butter or cheese from surplus milk; in the weighing up of, or the omission to book, sales of cake, meals and sundries; cost in the use of fuel and the machinery sundries; the balance of outstanding accounts, &c., &c.

All these details can be readily checked if the booking is properly planned and systematically carried out, but the time is well spent.

THE COST COMPARISON OF TYPICAL ESTABLISHMENTS.

Without going into a very detailed account of the machinery and plant required in accordance with several different schemes of work that might apply to either a collecting or central distributing depôt, a comparison of cost cannot easily be given, but judging from the share capital issue, and the turnover of certain establishments whose balance sheets have been examined by the writer, it is a fair assumption that the capital required, based on the following factors, is within reasonable distance of exactitude.

COMPARISONS OF CAPITAL INVESTED, CAPACITY AND TURNOVER
 ROUND FIGURES, OF CERTAIN FARMERS' MILK DEPÔTS, INDICATING
 THE CAPITAL REQUIRED ACCORDING TO THE SCOPE PROVIDED FOR

Index No. of Milk Depôt.	Nature of Activities Provided for.	Capital Invested, in £ Sterling.	Turnover Items.	
			Capacity in Gals.	Total Trading Value.
A.	Complete installation for wholesale milk, including pasteurising and bottling. Manufacture of cream and cheese. Sale of manures and feeding stuffs and other farmer's requisites, but no farm produce handled.	£12,000	per ann. 730,000 per day 2,000	12 months. £60,000 Working at nearly full capacity.
B.	Receiving and distributing depôt for milk, provision for cooling only; outfit for cheesemaking, and accommodation for foodstuffs.	£2,000	per ann. 146,000 per day 400	£8,300 Working at only three-fifths of capacity in milk.
C.	Collecting and distributing depôt for milk, cooling facilities; no provision for dealing with surplus; accommodation for stores.	£1,500	per ann. 73,000 per day 200	£3,750 Working at full capacity in milk.
D.	Receiving and distributing for milk, cooling only; outfit for cheesemaking; accommodation for coal and feeding stuffs.	£1,250	per ann. 73,000 per day 200	£3,500 Working at full capacity in milk.

COMPARISON OF INVESTMENT, CAPACITY AND TURNOVER, IN TERMS OF POUNDS STERLING PER DAILY GALLON OF MILK, AND SHOWING THE HIGHER RATIO OF TURNOVER TO CAPITAL INVESTED, WHERE THE FIELD OF OPERATIONS IS BIGGER AND MORE BUSINESS IS DONE.

Depôt Index.	Capital Invested, £ Sterling.	Gallons capacity, Milk.	Cost of investment, per gal.	Trade (total) Turnover: 12 months.		Ratio of Turnover to Capital Invested.
				£ Sterling		
				Milk.	Goods.	
A.	12,000	2,000	£6 0s.	50,000	10,000	5 times.
B.	2,000	400	£5 0s.	3,000	5,300	$4\frac{3}{4}$ „
C.	1,500	200	£7 10s.	2,000	1,750	$2\frac{1}{2}$ „
D.	1,250	200	£6 5s.	2,500	1,000	$2\frac{1}{5}$ „

Let us compare these investments :—

Depôt A.—Has required a heavy outlay in the shape of a large building and fairly thorough equipment, including a refrigerating and cold store plant, with which not one of the others is fitted, though, in these days, even the smaller milk depôts that aim to be self-dependent in the liquid milk trade, do well to consider the point. Such an outfit also permits of dealing with supplies much in excess of the average output, particularly where the plant affords alternative treatment to surplus milk, *i.e.*, to carry over in cold store for next day's requirements, or to manufacture into cream or cheese. Depôt A. can deal with a 25 per cent. increase in supplies for occasional periods of time without unduly feeling the strain, provided temporary additional labour is available.

Depôt B.—Is well fitted up, but handicapped for want of a cold store plant, which hinders any provision for the sale of accommodation milk, especially in a district of small holders. The ratio of the turnover to capital invested would be higher if supplies were up to full capacity. Note the comparison of milk and goods sold.

Depôt C.—Cost more as an original investment by reason of the purchase of motor transport, and is handicapped in having only one outlet for milk, *i.e.*, by direct sale. This may prove a serious matter in selling, especially in a flooded market.

Depôt D.—Is in good shape for work at all seasons of the year, according to requirements or necessity, but so much may be said of it partly because it lies in a district where there is a ready sale for winter cheese. Owing to the lack of cold storage facilities, the summer milk

trade requires careful attention, and accommodation profits are not often possible.

It may be remarked here that, however desirable as a convenience to members, the provision of transport for collecting milk constitutes a heavy charge on capital, unless the means of transport is hired, and in either case it is necessary to cover this expense by a collection charge upon the milk brought in. Certainly, the collection of small quantities of milk at the roadside is a great convenience to those in a small way of business as milk producers, but it may make a difference of as much as 40s. per daily gallon in the capital required.

Naturally, a depôt dealing with milk, hay, corn, potatoes, and general farm produce and requirements, in the shape of cake, millers' offals, manures, coal, &c., would need an effective transport outfit to deal expeditiously with all these departments, and correspondingly more capital would require to be invested.

Upon the lines suggested, may be built up a far-reaching and very useful organisation. The development and growth of such a business is equally dependent on the policy of the committee, the loyalty of the shareholders, and the administration of the manager.

As before stated, it is the members in a large way of business who are most tempted by outside traders. The products they have to sell and the requirements they buy are in bigger quantities, and call forth the best efforts on the part of private traders to secure their business. But often these are the men who are generous in ignoring such temptations and who face a few sacrifices in order to do their bit in setting the concern on its feet. The smaller men are more dependent upon, or rather have more to gain by, co-operative effort. They realise that there are strong reasons why men in better circumstances can get better prices. But if the true co-operative spirit is aroused, they do their best to follow a good lead and work towards the building up of a sound business. This is how it becomes possible to distribute a bonus at the finish of a good financial year, in proportion to the amount of business due to the member concerned.

MY IMPRESSIONS AS A FOREIGN DELEGATE TO THE WORLD'S DAIRY CONGRESS, 1928.

By R. N. GÖRANSSON.

WHEN one has gathered a favourable impression about something, as in the course of my editorial work for the Review *Le Lait* I had formed about dairying and the dairy industry in Great Britain, by reading numbers of publications about dairying research and the application of its results in the United Kingdom, there is some satisfaction in being able to verify, if this impression is well founded.

I frequently had the opportunity to visit Great Britain both before and during the War, and I had learned to appreciate the qualities of the British people. This circumstance and the wish to verify, if my impression of the British dairy industry was right, and if those sterling qualities, which I knew by their results in other domains, were given full play here, were the chief reasons for which the announcement that the World's Dairy Congress of 1928 was to be held in the United Kingdom, was for me a cause of great satisfaction.

When receiving the draft programme about Christmas 1927, I was struck by the organisation of the Congress; there was no need to be a great observer to see that the most important points of milk production, handling and processing would be discussed. The fact that papers were to be read by some of the most distinguished British and foreign dairying research workers and prominent representatives of the dairy industry from Great Britain and from abroad, that the functions of president and secretary of different sections were to be assumed by scientists and members of the milk industry, seemed proof that adequate importance was assigned, by the organising Committee, both to science and practice; while the interest which the British Government bore to the Congress was amply shown by the fact that H.M. the King had accepted the Patronage, and also by the promised active participation of the Honorary Presidents, the Right Hon. Walter Guinness, M.P., and the Right Hon. A. N. Chamberlain, M.P., respectively Ministers of Agriculture and of Health. All this augured well for the Congress.

These were my first impressions, probably many had similar ones, if one may judge by the great number of delegates from different parts of the United Kingdom and from abroad, and the fact, that not only quantity but also quality was present.

The choice of the Wesleyan Central Hall, Westminster, as the London home of the Congress was certainly approved by the majority

of delegates ; not only because it could be reached in a short time, without any difficulty, from any part of London, and its spacious rooms were suited for important meetings, but also because of its situation, near some of the most striking and venerable monuments in the United Kingdom ; one of the points of the Great City where past and present meet, calling before the mind past and actual grandeur.

These are personal impressions, but they were shared by those foreign delegates who were known to me.

Very often at large meetings, in an unfamiliar place, of individuals not speaking the same language, some of them may have an uneasy feeling of being more or less lost, through the difficulty of obtaining sufficient information. I do not believe anyone had such feeling at the Congress, any apprehension of it would have been immediately dispelled by the obliging ways of the ladies and gentlemen who, in the reception room at the Central Hall, assumed the arduous task of registering the delegates and giving every information wanted about the Congress, its proceedings, the excursions, the receptions ; any such feeling, if it existed, soon made way for the one of being an honoured guest.

A fact which was the object of much eulogistic commentary, was the translation of many papers into French and German, this certainly afforded the delegates who did not speak current English a great facility for following the proceedings of the Congress.

If I insist upon these details, it is because they are striking evidence that the organisation of the Congress was the work of practical men who aimed to make the Congress a success ; and giving an unbiased opinion, I may say they succeeded in every way ; the section conferences were replete with scientific and practical interest ; the receptions were brilliant and marked by an atmosphere of congeniality often lacking at such functions ; the excursions were arranged in a way to show different interesting aspects of dairy farming and the dairy industry in Great Britain ; therefore I did not hesitate to accept the invitation of the Council of the British Dairy Farmers' Association to write down my impressions for their JOURNAL about the World's Dairy Congress.

A review of the papers read at the Congress would certainly be interesting, but would take too much space and time, and what is more is needless, as they can be read at leisure by everyone. However, some of them were followed by discussions where some facts of great importance were mentioned, one of these papers was, "Metals and their various influences on Milk," by M. O. F. Hunziker, Director of the Research Laboratory of the Blue Valley Creamery, Chicago. The subject, of major importance for the dairy industry, had attracted a great number of delegates ; the general impression was that M. Hunziker had given a very substantial review of the different metals

and alloys used for the construction of dairy equipment, their qualities and defects. The discussion induced by this paper brought about a very interesting communication from Professor Porcher, Principal of the State Veterinary College of Lyon, certainly the most prominent dairying research worker in France, Chief Editor of the Review, *Le Lait*. Professor Porcher mentioned data of some experiments at his laboratory, showing that, after certain time, the presence of infinitesimal traces of nickel may develop abnormal flavours in butter-fat.

Another communication which may prove of great importance for the future was made at the Conference of Section II, where Dr. H. E. Van Norman and Professor A. Miyawaka read their papers about Powdered Milk. Professor Porcher, whose research work and publications on Milk Powder, *e.g.*, his book "*Le Lait Desséché*," qualify him as one of the great authorities on this question, communicated data about some experiments at his laboratory in which he succeeded in making cheese from remade milk prepared with milk powder obtained by the Spray process.

From my point of view, one of the most important subjects discussed at the World's Dairy Congress of 1928 was the "Routine Veterinary Inspection of Dairy Cattle." It is not generally known that already at the First World's Dairy Congress, at Brussels, in 1903, among other resolutions concerning hygiene of production and handling of milk, the following was passed: *It is necessary to organise a sanitary and hygienic inspection of dairy stables where milk is produced for human consumption*. In his paper, Mr. A. W. Noel Pillers, Deputy Veterinary Officer of the city of Liverpool, and in the discussions, many British and several foreign delegates, *e.g.*, Professor Porcher and Professor Von Ostertag, who rank foremost in the veterinary profession in their respective countries and are known by their remarkable work on the hygiene of foodstuffs of animal origin, all insisted upon the necessity of this routine inspection of dairy cattle; an indispensable factor for the production of good safe milk.

One may hope that the resolution now passed in consequence will get more consideration from the legislators than those of 1903, now that it can no more be denied that pasteurised milk cannot be of good quality if the raw product was of bad quality, and that it is known that pasteurisation is not always infallibly 100 per cent. perfect in destroying pathogens in milk, and, therefore, no safeguard of the milk supply may be neglected; further, it has been amply proved, *e.g.*, by the results obtained by Dr. Stenhouse Williams and his staff of the National Institute for Research in Dairying, that the production of raw milk credited safe, *i.e.*, Grade A, is not a practical impossibility.

It would not do to omit the mention of the paper of Dr. Stenhouse Williams, "Education and Advisory Work amongst Milk Producers

and the Handling of Milk at the Farm," which gave a substantial review of the factors which have brought about the remarkable progress of dairy farming in the United Kingdom during recent years, the interest of which was enhanced by the fact that, important conferences being held at Reading, most delegates had the opportunity to see the results of the splendid work of Dr. Stenhouse Williams and the staff of the National Institute for Research in Dairying.

Even in the most satisfactory events disappointment can never entirely be avoided. I was, however, only disappointed by one fact, my time was very limited, and in such way, that it was a practical impossibility for me to assist at the Scottish part of the Congress; which, if I judge rightly by the programme, and if it was as well organised as the London part, must have been very interesting, and also to visit the Royal Agricultural Show at Nottingham. My disappointment in missing this last item was made the greater by the fact that there was a special exhibit of dairy machinery representing the latest methods of handling milk and the latest equipment used in the manufacture of milk products.

A few words about the tours to the farms around London and the milk distributing plants in the Metropolitan area. As was the case in the more important excursions, these tours were eminently suited to show different interesting aspects of dairy farming and the dairy industry in the United Kingdom. Being morally duty bound to assist at the conferences of Special Section B, "Veterinary Medicine in reference to Dairy Cows," where "Routine Inspection of Dairy Cattle" was the main subject discussed, I had only one afternoon, Wednesday, 28th June, for these tours; the one I took included a visit of the pasteurising and bottling plant of the United Dairies, Ltd., at Willesden. It will not be necessary to labour my impressions, but for one who has seen the London milkmen of the past, with their handcarts and their call, "Milk, Ahoy," delivering milk from their cans in open jugs, often left by the consumers on the doorsteps, and who now sees the equipment and the handling of milk at this plant, the progress realised in a few years seems wonderful, and certainly the continental delegates who, at this plant, assisted at the processing of the milk, from the receiving platform till the loading of the finished product on the insulated motor lorries, ready to start for the distributing depôts, had the impression that a milk supply thus organised keeps pace with progress.

I was sorry not to have been able, for aforementioned reasons, to visit some of the dairy farms producing Certified and Grade A.T.T. milk; I am convinced, however, that there also I should have had the same impression of progress.

To summarise in a few words, I may affirm that I was very interested in the proceedings of the Congress, and was very pleased to

verify that I had not over-estimated the progress of dairy farming and the dairying industry in Great Britain. I am convinced that the improvement of the milk supply brought about by this progress is more than amply sufficient to legitimise the efficient propaganda work of the National Milk Publicity Council for an increase in the consumption of milk, of which I saw some striking examples during the few days I was in London for the World's Dairy Congress.

To conclude with a general impression, I am certain that the foreign delegates at the last World's Dairy Congress went home with the feeling that their time had been usefully and agreeably spent, and with the conviction that Great Britain, in the domain of dairy farming and of the dairy industry, is, and has the ambition to stay, in the vanguard.

THE VISIT OF THE WORLD'S DAIRY CONGRESS, 1928, TO NORTHERN IRELAND.

By DR. G. SCOTT ROBERTSON, D.Sc., F.I.C.

FORTY-THREE delegates to the World's Dairy Congress, representing fifteen different countries, took part in the excursion to Northern Ireland. On their arrival in Belfast on Friday morning, July 13th, the Minister of Agriculture, Sir Edward Archdale, Bart., joined them at breakfast and extended to the party a hearty and warm welcome to Northern Ireland. Unfortunately, only two days were available for visiting features of interest in Northern Ireland, and with a view to giving the visiting delegates some idea of the scenery of Northern Ireland the itinerary of visits was planned with a view to taking the delegates round as much of the country as possible.

Immediately after breakfast the party left for the Belfast Co-operative Society's milk depôt where they were received by the Society's Managing Secretary, Mr. B. Spraggon, and Mr. J. Hill, the Manager of the depôt. The Belfast Co-operative Society distributes about one-sixth of the liquid milk consumed in Belfast. The supply, which is collected by the Society's service of motor lorries within a radius of 50 or 60 miles from Belfast, is all assembled at their Belfast depôt where an up-to-date pasteurising plant has been installed. The buildings, a large addition to which has recently been completed, the milk pasteurising and mechanical bottling plant, and the special machinery for washing returned bottles, cans and churns were inspected. The method of payment to farmers by the Society was explained, namely, by a standard price for milk of 3·5 per cent. butter-fat, with corresponding increases or decreases in the price per gallon according to the butter-fat content. A small milk testing laboratory forms part of the depôt equipment and a bacteriological laboratory has recently been installed in connection with the efforts which the Society is making to improve their supplies from the cleanliness point of view.

At the conclusion of the inspection the party left by motor-bus for a run of 80 miles by road to the Giant's Causeway. From a scenic point of view the trip is probably one of the most beautiful if not the most beautiful in the British Isles. From Belfast the road follows the Belfast Lough to its head at Whitehead and then by the shores of Larne Lough to Larne, where the party had lunch. From Larne, the road passing through Glenarm, Garron Tower, and the entrance to Glenariff is a true winding coast road, cut out of the hillside and

running round every bay and creek until Cushendall is reached. The scenic effect is unsurpassed and a magnificent view of the Scottish coast from Stranraer to the Mull of Kintyre is obtained. From Cushendall the road rises rapidly over the Antrim mountains to a height of 1,400 feet, subsequently descending to Ballycastle. From Ballycastle to the Giant's Causeway the road follows closely the North Atlantic sea coast passing *en route* Carrick-a-rede with its famous swinging bridge.

The delegates stayed at the Causeway Hotel overnight ; the more energetic members walked over the Giant's Causeway the same evening whilst the remainder deferred their visit until early the following morning.

An early start on Saturday morning enabled the party to reach Ballyrashane Creamery by 11 o'clock, where they were met and welcomed by the Manager, Mr. J. Lyons, and several members of the Committee of Management, and by Dr. James S. Gordon, C.B.E., the Permanent Secretary of the Ministry of Agriculture. A tour of inspection of the Creamery followed and great interest was evinced in the system adopted of payment according to quality for the milk received from the farmers. It was explained to the visitors that the Creamery is developing with marked success a cream trade with various centres in England and Scotland such as Manchester, Leeds, Birmingham and Glasgow. Owing to the care exercised in handling the milk and cream and the process of double pasteurising adopted no difficulty is experienced in placing the cream on the English and Scottish markets in a perfectly sweet condition. The English and Scottish delegates were particularly interested in this phase of the Creamery's activities in view of the fact that it is no longer permissible to add preservatives to cream sold in Great Britain.

At the conclusion of the inspection the delegates proceeded to Portrush for lunch and then continued their journey by road to Miss Robertson's farm at Dog Leap, Limavady, passing through Coleraine and Castlerock, the road from Castlerock to Limavady Junction hugging closely the North Atlantic sea coast.

At Dog Leap, Miss Robertson conducted the party over her farm buildings. Her pedigree herd of Kerry cows and all the young stock had previously been brought indoors with a view to facilitating their inspection. Keen interest was taken in the herd of Kerry cows and the now familiar methods of Grade "A" (T.T.) milk production.

The outstanding features of this arable farm of 300 acres are a pedigree herd of 50 Kerry cows, Large White Ulster sows which are crossed with York boars, the litters being reared and fattened for bacon, a poultry plant and a commercial garden specialising in

vegetables and cut flowers. What perhaps impressed the delegates most of all was the fact that such a model farm could really be run as a commercial success and Miss Robertson was subjected to a continuous volley of rapid questions on this subject—particularly by the Scottish members of the party. After tea had been provided a very hearty vote of thanks was returned to Miss Robertson for her kindness and hospitality.

The delegates rejoined the waiting buses at 4.30 and after a 70 miles drive over the Derry hills, and with a race against time, reached Belfast a little late, but not too late for the Government dinner, a function which provided a fitting climax to a strenuous but most enjoyable tour. On behalf of the Northern Government, the Rt. Hon. Sir Edward Archdale, Bart., Minister of Agriculture, received the delegates and presided at the dinner. In proposing the toast of the World's Dairy Congress, Sir Edward, after extending a very hearty welcome to the visitors, explained that although Northern Ireland forms a very small part of the British Empire it is by no means a negligible factor from the agricultural point of view. Northern Ireland's output of milk and butter is about £3,000,000; livestock, £5,500,000; and poultry, eggs and feathers, £3,350,000. Dealing with the question of education he explained that Northern Ireland is a country of small holdings, the average size of the farms being 23 acres, compared with 62 acres in Scotland, and that as a consequence Northern Ireland had over 104,000 farms compared with approximately 70,000 in the whole of Scotland, a state of affairs which makes the problem of agricultural education a much more difficult one than in either England or Scotland, particularly in these days of stringent economy when money for development purposes is difficult to secure. Sir Edward then proceeded to give the delegates a brief outline of the steps which his Ministry had taken to enable Northern Ireland to maintain and improve its position on the cross-Channel markets. He drew attention to the Live Stock Breeding Act which makes compulsory the licensing of all bulls. This Act has the backing of the vast majority of the farmers and it is for that reason that its administration has been such a marked success. Northern Ireland is nearing the day when every bull in the country will be up to the present premium standard. There could be no doubt that a rapid and wonderful improvement is taking place, not only in the cattle sent to England and Scotland, but in the home cattle population.

Eggs, Sir Edward continued, are one of Northern Ireland's most valuable exports. When the Northern Ministry of Agriculture commenced operations Irish eggs held the bottom position on the British market largely because producers held back their eggs for a rise in price and seemed to be generally under the impression that any eggs, dirty or stale, were good enough to send to England. The Marketing of Eggs

Acts had completely altered this position by making close grading compulsory, and the sale or exposure for sale of stale or dirty eggs an offence under the Acts and the North of Ireland egg had rapidly risen to the top of the market price list. In conclusion, Sir Edward said he was proud to welcome such a representative gathering that evening and expressed the hope that on some future occasions they would return to Northern Ireland. The toast was suitably responded to by Mr. Allan, who, in the course of his speech, explained the objects of the World's Dairy Congress, and in conclusion, stated as the opinion of the delegates that they had never seen such a fine selection of stock in any country. Mr. S. Orla Jensen, of Copenhagen, on behalf of the delegates proposed the toast of the Chairman, to which Sir Edward briefly replied. The proceedings terminated with the singing of Auld Lang Syne and the National Anthem.

On the following day (Sunday) the delegates had an opportunity of resting after their strenuous two days' tour and left by the late afternoon train for Dublin.

THE WORLD'S DAIRY CONGRESS, 1928.

London Section and Machinery Exhibit at Royal Show.

By J. GILLARD STAPLETON.

THE World's Dairy Congress, 1928, which commenced on the 26th June, was the most important function which has taken place in the Dairying World for many years. It must be remembered and placed on record that the British Dairy Farmers' Association was primary responsible for initiating the first definite movement in promoting the organisation that finally carried out all the necessary arrangements required in the proper co-ordination of the details for the successful running of the Congress. This was done in the face of very serious opposition to the proposal, when it was first made, and during the early stages of the discussions between those concerned. Those desirous of taking part in the Congress were required to register, and the number registered was 1,965 representing 53 countries. The Congress and the subsequent tours lasted from the 26th June to the 21st July, but of this period only the six days from the 26th June to the 1st July were spent in London.

The headquarters of the Congress were at the Central Hall, Westminster, which building was well suited for the purpose, there being ample accommodation for two sessions to run concurrently, and lunch was provided at the Central Hall for those who cared to avail themselves of this time-saving arrangement.

There were large attendances at each session to hear the various papers and the discussions thereon; the papers, which were read or taken as read, having previously been circulated in three languages—English, French, and German.

On the morning of the 27th, the Minister of Agriculture and Fisheries, the Right Hon. Walter Guinness, M.P., on behalf of the Government, welcomed the assembled delegates, after the President of the International Dairy Federation, Monsieur Jules Naenhaut, had responded, the work of the sessions began. Viscount Astor presided over the session devoted to the subject of Milk Production, and Mr. J. J. Kearns, President of the Creamery Proprietors' Association, over the other, which considered questions under the heading of Distribution and Manufacture. In the afternoon there was a session presided over by Dr. F. H. A. Marshall, Reader in Animal Physiology, University of Cambridge, dealing with Animal Physiology.

The sessions on the 28th, which were a continuation of those of the previous morning, were presided over respectively by Mr. E. W. Langford, ex-President of the National Farmers' Union, and Mr. J. H. Maggs, President of the National Federation of Dairymen's Associations, and the afternoon session dealing with veterinary questions, was presided over by Lt.-Colonel Brittlebank, President of the Royal College of Veterinary Surgeons.

On the morning of the third day, there was a single session dealing with Milk Consumption, Administration and Control. Sir George Newman, Chief Medical Officer, Ministry of Health, presided. There was probably the largest attendance of all at this meeting. The afternoon was again occupied considering veterinary questions, again under the presidency of Lt.-Colonel Brittlebank.

The social side of the Congress was declared by all to have been a marked success. It commenced with a luncheon by the Government to the members of the International Dairy Federation, presided over by the Minister of Agriculture and Fisheries, the Right Hon. Walter Guinness, M.P., and on the evening of that day there was a reception of the delegates at Lancaster House by the Minister of Health, the Right Hon. A. N. Chamberlain, M.P., and Mrs. Chamberlain, on behalf of the Government.

On the following evening the delegates were entertained by the Corporation of the City of London in the ancient Guildhall, and the overseas delegates with one accord stated that never before had they been so lavishly welcomed; it indeed left a marked impression on the minds of all present of the importance to the peoples of the world, of what is undoubtedly the most ancient industry associated with the development of the human race. The Lord Mayor and members of the City Corporation by attending in state to receive their guests provided a most remarkable and profoundly inspiring setting for this World's Dairy Congress, the first to be held in England.

On the evening of the 28th the Congress Committee invited all the delegates to a reception at the Crystal Palace, with a supper and musical programme, which was followed by a grand display of fireworks. Some twelve hundred delegates were present.

On Friday, the 29th, the Congress Committee gave a luncheon to all the lady delegates, and the wives and daughters of delegates at the Café Royal, when Lord Desborough, Chairman of the Committee, presided.

In the evening the Government gave a dinner to the official delegates, which was presided over by the Right Hon. Walter Guinness, M.P., Minister of Agriculture and Fisheries.

On Saturday, the 30th, the delegates visited Windsor, and by permission of His Majesty the King, were shown over the Castle and the Royal Farms, and were entertained by His Majesty to tea.

On Sunday, July 1st, Mr. and Mrs. Titus Barham were "At Home" to the delegates at Sudbury Park. The day was very fine, and the delegates thoroughly enjoyed themselves among the lovely surroundings, and were afforded the opportunity of inspecting the Sudbury Park Farm, together with the equipment of this model Certified Milk Dairy.

After the visit to Reading, on the evening of July 3rd, the British Dairy Farmers' Association entertained the official delegates and other guests to a banquet at the Holborn Restaurant. Lord Desborough presided, and amongst those present were the Earl of Stradbroke, Parliamentary Secretary to the Ministry of Agriculture and Fisheries, and the Hon. W. R. Motherwell, Minister of Agriculture for the Dominion of Canada, and many of the prominent people associated with the Congress.

During the whole period of the Congress the weather favoured us, and many comments were made by the overseas visitors with regard to the wonderful spell of summer sunshine which we experienced.

No less successful were the visits of the delegates to Reading, Scotland, Ireland and the Royal Show at Nottingham, where a wonderful display of modern Dairy Machinery and Equipment, the largest ever seen in this country, was shown to great advantage in a large building erected for the purpose. The Congress terminated with mutual expressions of goodwill, and I believe that most satisfactory results will follow the interchange of ideas and experiences of representatives from all parts of the world.

A full report of the papers and discussions will shortly be published, a free copy of which will be forwarded to all the delegates, and a copy will be deposited in the Library of the British Dairy Farmers' Association for the convenience of those Members of the Association, who were not delegates.

It would not be fitting to refer to the operations of the World's Dairy Congress without paying tribute to the great ability of the organising secretary, Mr. A. D. Allen, O.B.E., who was responsible for carrying out the actual work with the assistance of the various committees appointed to help him. With his great experience of everything connected with the Dairying Industry, he certainly proved to be the right man for the work in hand.

RECORDS OF TYPE, SIZE AND PRODUCTION OF REPRESENTATIVE ANIMALS AT THE LONDON DAIRY SHOW, 1928.

By J. Q. LAMB, M.P., W. F. JESSOP, and S. BARTLETT.

From time to time suggestions have been put forward that permanent records of type, size and production of representative animals from the different breeds, exhibited yearly at the London Dairy Show, would be of great interest to present-day breeders; also, the value of such records would increase yearly and prove of great assistance to future breeders, students of heredity and others. In April, 1928, Mr. J. Q. Lamb was responsible for bringing before the British Dairy Farmers' Association Council a definite proposition that records of representative animals at the London Dairy Show should be preserved.

As a result of this proposition, a small sub-committee was appointed to consider the best methods of carrying out the work. The advice of the Sport and General Press Agency, Limited, was sought regarding certain technical points in connection with photographs, and the willing co-operation of their experts proved very helpful in planning the work, and the first set of records was obtained at the 1928 Show.

When deciding upon the system to be adopted for recording these animals the general aims were that the records should be as near the truth as is humanly possible, and stated in such a manner that the conditions could be repeated at any future date with any dairy cows for purposes of comparison. In order to record the complete conformation of a cow, nothing short of a model will suffice, but by means of photographs, measurements of various body parts and live weights, an excellent impression of type and size can be secured, and it was these less expensive and more practicable methods which were adopted.

SELECTION OF ANIMALS.

The number of animals which could be dealt with was of necessity somewhat small, and as a basis of selection it was decided to record only the first prize winners in each of the mature cow classes. In classes where the same animal won the first prize for Inspection and Milking Trials, it was only necessary to deal with one animal in that breed, but where the Inspection winner and Milking Trials winner were different animals, both were recorded.

Exact details as to the method of obtaining each form of record are given in the following notes:—

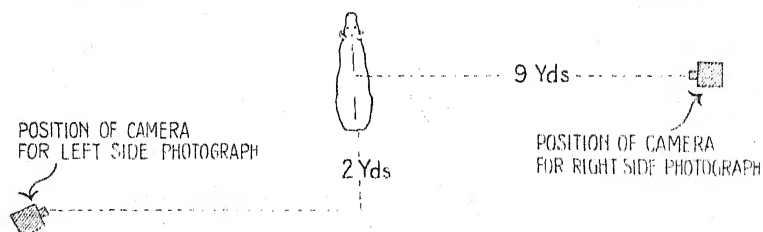
1. PHOTOGRAPHS.—The means commonly adopted in animal photography in order to hide defects are as follows: (1) To make a

special choice of ground on which the animal stands ; (2) to take the photograph at the most effective angle ; and (3) to partly milk certain quarters of the udder in order to balance the shape. Further, distortion can occur by the use of an unsuitable camera, and negatives or prints may have certain defects obliterated. When carrying out the present work every endeavour was made to obtain truly representative photographs, the cows were milked clean at 10 p.m. and photographed about 12 hours later, standing on level ground with the camera held at approximately the same height as the cow. Two photographs were taken of each cow, one from the right and one from the left side, the relative position of cow and camera is shown in the sketch below.

The right side photograph was intended to show a complete and non-distorted side view ; the head of the cow was turned very slightly towards the camera but not sufficient to mask the lines of the neck. The right hind leg was placed back in order to show as much of the fore part of the udder and teats as possible.

The left side photograph was obtained from slightly behind the animal with the head turned more completely to show the face and the legs arranged as in the right side position to show the development of the rear part of the udder. The focal length of camera was 10 ins., and the size of plates 4 ins. by 5 ins., thereby giving practically no distortion ; the camera was held about 9 yards from the cow.

RELATIVE POSITION OF CAMERA AND COW FOR PHOTOGRAPHS.



With regard to the printing of the photographs, certain undesirable features of the background were eliminated, but in no case was the outline of the cow touched.

2. LIVE WEIGHTS.—The weighing of all cows exhibited at the Dairy Show is commenced at 10 a.m. on the Saturday preceding the Show week ; at this time some of the animals have been in the Agricultural Hall two days, while others may have arrived only a few hours previously. There are two reasons why the weights recorded may be assumed to be comparatively low. Firstly, the live weights of the different animals are taken into account in the award of the National Milk and Butter Cups, and since a low live weight increases the points per 1,000 pounds live weight, it is probable that most owners see that

their cows are weighed when fasted—or at anyrate not in a well-fed and watered condition. Secondly, most of the cows at the Show are farrow and recently calved, a condition when minimum live weights are normally obtained. On the other hand, it is uncommon for a cow to be sent to the Show in a poor condition.

3. MEASUREMENTS.—When used as a supplement to photographs, measurements give a more correct indication of size than live weights, which are affected by the fatness of the animal. Measurements, as set out below, were taken with the cow standing in a natural position, the four legs forming a rectangle on a level floor. All measurements were taken by callipers (see diagram below) or tape, and each result was checked by a second measurement taken after moving the animal.

Each measurement is described below under lettered sub-headings, and as many as possible are illustrated on the accompanying diagram, the same letters being used on the diagram as appear in the sub-headings.

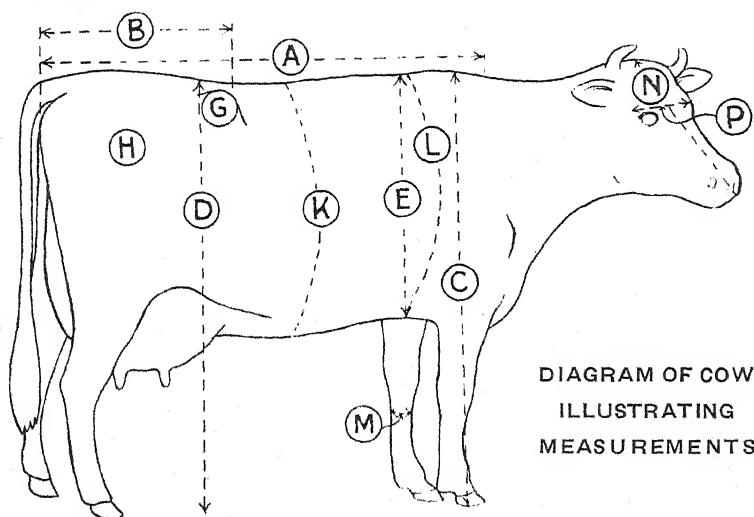
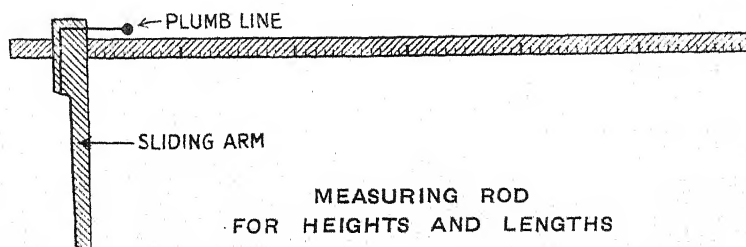
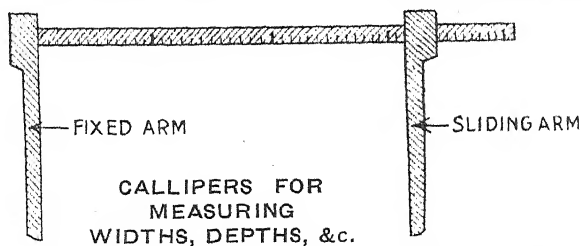


DIAGRAM OF COW
ILLUSTRATING
MEASUREMENTS





(a) *Length of body* taken along the backbone from one of the pin bones to the withers; the exact position of the front point used in this measurement was decided by a mental line connecting the points of the shoulder blades most forward and nearest the backbone. Both left and right pin bones were used in turn, and if the animal was standing square the two measurements agreed closely.

An L shaped measuring rod or standard (see diagram) such as is used for measuring heights of animals was placed with the long arm along the backbone and the short arm on one of the pin bones. The front point of the shoulder blades was found by the finger and thumb, and the length of the back noted.

(b) *Length of hind-quarters* from pin bones to hooks. The measuring rod recording total length of body was kept in position, and a string stretched across the back connecting the front points of the hook bones, by this means the length of the hind-quarters could be observed on the measuring rod.

(c) *Height of withers.* The L shaped measuring standard used for recording heights is well-known, a plumb-bob was used to ensure an upright position, and one measurement was taken from each side of the animals in case the floor might be slightly uneven.

(d) *Height at hooks.* The height of the cow at a point in the backbone, midway between the hooks, was recorded in the same way as height at withers.

(e) *Depth of chest* was recorded by callipers, just behind the front legs.

(f) *Width of chest* was measured just behind the shoulders, the callipers being drawn fairly tight, but not sufficient to cause discomfort to the animal.

(g) *Width of hooks* indicates the measurement obtained by placing the callipers over the outside of the hook bones.

(h) *Width of thurls* was obtained by drawing the callipers slightly to the rear after measuring the width of the hooks, the approximate position is indicated on the sketch by the letter (H) in a circle.

(k) *Girth of barrel* was measured by a tape at the point of maximum size in the barrel, the measurement is not very reliable and is influenced appreciably by feeding times.

(l) *Girth, behind shoulder*, is self explanatory, the tape was overlapped and drawn about as tight as would be required to extend a spring balance six pounds.

(m) *Girth of the fore leg* was taken at the smallest point below the knee, the tape being drawn tight.

(n) *Length of head* was measured by tape from the base of the horns to the tip of the nose.

(p) *Width of head* was taken at the wide point, just above the eyes.

4. RECORDS OF PRODUCTION.—The items of production from a dairy cow are normally calves, milk and, finally, beef. Whilst live weights will give some idea of the ultimate value of a cow for beef, this item can scarcely be considered seriously in the present records.

Calving dates and official milk records, however, can give a fairly complete history of an animal in respect of other produce, and all owners of prize winners, were requested to supply this information (if available) up to October 1st, 1928. It was not expected that records of every animal would be forthcoming, but it is probable that this information will become more complete each year, particularly in respect of milk and butter-fat yields.

The information received in respect of each animal is stated in the form of milk yield for each complete lactation period, together with the date of calving, the number of days the cow was recorded, suckled a calf, and was dry. These yields have been verified by the appropriate Milk Recording Society, and the willing co-operation of these societies, as well as the owners of prize winners, has been a great help in making the records comparatively complete and reliable. Calculations of butter-fat yields have been made for animals which were tested for butter-fat at regular intervals by a Milk Recording or Breed Society, the method of calculation being the same as that recently adopted by the Shorthorn and Guernsey Breed Societies, *i.e.*, a system based on the estimated weight of butter-fat produced in a complete lactation period. The results obtained by this method do not agree in all cases with other published figures of butter-fat production of the same animals, and where differences occur, it is due to different methods of calculation and not necessarily to improper testing. The method adopted in these records is standard for all cows, and is becoming recognised by many authorities as being more accurate than most other schemes in common use.

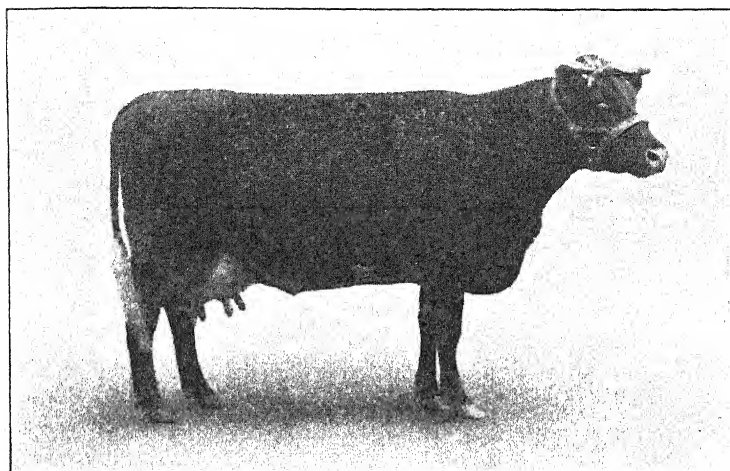
Records obtained during the Show of two days' milk yield, and one day's fat yield for each cow may be found in the report of the milking trials.

The following pages show photographs and all available official production records of each first prize winner, also measurements of all the cows will be found on page 128.

An album containing the original photographs, together with records of measurements, live weight and production will be prepared and kept as a permanent record at the offices of the Association. The value of this album as a record would be considerably increased if the owners of the cows would supply records of milk and butter-fat as each future lactation period is completed, so that the album would eventually contain complete life time production records of each cow.

MEASUREMENTS OF FIRST PRIZE WINNERS, LONDON DAIRY SHOW, 1928.
TAKEN OCTOBER 24TH & 25TH, 1928, BY S. BARTLETT.

Number	5	15	74	95	96	114	120	161	164	170	171	174	215	225	244	262	265	278	328	338
First Prize— Inspection or M.T. ...	Insp.	M.T.	Insp. & M.T.	Insp.	M.T.	Insp.	M.T.	Insp. & M.T.	M.T.	Insp.	Insp.	Insp. & M.T.	Insp. & M.T.	Insp.	M.T.	Insp.	M.T.	Insp. & M.T.	Insp. & M.T.	Insp. & M.T.
Name ...	Lowgroves Spout th.	Loughills Blair.	Dossie.	Burton Red Rose	Langford Barned	Sudbourne Flossie	Forting Tingue.	Milkmaid 14th.	Foreman 3rd.	Alice 50th.	Wrexall Darting	Bretten- ham	Seary Alice.	Hale John Jamy	Barnover Dva.	Thromes Isabel	Southern Starrlette.	Sixy Five	Warlands Clover.	Christland Taxis.
Breed ...	Red Short-horn.	Red Short-horn.	N.P. Short-horn.	Lincoln Red.	Lincoln Red.	British Friesian.	British Friesian.	South Devon.	Dairy South Devon.	Dairy South Devon.	Dairy South Devon.	Red Poll.	Blue Abdon.	Ayrshire.	Ayrshire.	Guernsey.	Guernsey.	Jersey.	Kerry.	Dexter.
Live Weight ...	lbs. 1,238	lbs. 1,280	lbs. 1,346	lbs. 1,276	lbs. 1,270	lbs. 1,592	lbs. 1,380	lbs. 1,658	lbs. 1,269	lbs. 1,571	lbs. 1,482	lbs. 1,334	lbs. 1,350	lbs. 1,414	lbs. 1,280	lbs. 1,206	lbs. 1,152	lbs. 936	lbs. 935	lbs. 756
(a) Length of Body ...	in. 53.7	in. 59.0	in. 62.1	in. 57.9	in. 60.6	in. 66.3	in. 61.8	in. 65.8	in. 59.5	in. 65.8	in. 59.4	in. 58.0	in. 59.5	in. 59.9	in. 60.2	in. 58.0	in. 57.3	in. 54.4	in. 53.0	in. 46.8
(b) Length of Hind Quarter	18.8	19.6	20.5	18.8	19.8	21.5	20.8	21.1	20.8	21.8	20.8	19.9	19.0	19.9	18.8	19.7	19.0	18.0	18.1	16.0
(c) Height at Withers	50.7	53.3	54.2	52.9	53.3	58.9	57.8	54.9	53.1	56.7	53.2	51.5	52.3	52.0	52.0	50.1	51.4	48.4	47.5	39.4
(d) Height at Hooks	51.6	52.8	55.5	53.0	53.1	58.9	55.4	50.4	53.3	57.3	53.4	52.0	53.2	52.4	53.2	49.2	51.0	48.7	47.8	40.5
(e) Depth of Chest ...	28.4	29.5	30.4	28.6	30.8	31.9	32.0	31.6	29.4	31.0	30.3	29.7	29.0	29.3	28.8	28.0	28.5	26.9	26.6	23.6
(f) Width of Chest ...	16.8	17.0	20.0	18.0	16.2	17.3	16.9	18.2	16.2	17.5	17.9	19.3	17.3	16.5	14.5	16.1	15.3	14.7	14.9	14.9
(g) Width of Hocks...	22.6	23.7	24.6	23.0	22.7	23.9	23.8	24.3	22.3	23.8	23.4	23.5	22.5	22.4	22.8	21.2	20.8	20.2	19.2	16.7
(h) Width of Thurls...	10.2	18.8	21.1	19.0	19.5	22.3	21.8	20.8	18.8	20.9	19.5	18.5	19.6	19.6	18.6	18.2	17.1	16.8	15.0	15.2
(i) Girth of Barrel ...	92.3	92.6	100.3	92.3	91.0	93.6	91.5	103.0	92.5	99.4	100.7	93.0	95.9	95.0	93.5	92.0	87.0	88.7	89.4	78.2
(j) Girth behind Shoulder	74.6	77.9	80.9	79.4	77.2	81.6	79.3	83.0	76.5	81.0	79.0	79.2	76.4	74.8	71.2	72.0	71.6	67.7	67.6	61.1
(k) Girth of Fore-leg	6.8	7.2	7.2	7.4	7.5	7.5	7.4 and 7.7	7.8	7.0	7.8	7.2	7.1	7.0	7.0	6.9	6.8	6.5	6.0	6.0	6.1
(l) Length of Head...	19.8	20.6	20.4	20.2	20.7	23.0	21.2	23.2	21.8	24.3	19.5	19.6	20.8	20.1	21.8	20.0	19.8	19.0	18.2	17.0
(m) Width of Head ...	10.0	9.8	10.0	8.8	9.1	9.5	9.5	10.0	9.2	10.0	9.7	9.3	9.6	9.4	9.3	9.2	9.1	8.9	8.4	8.8



"LOWGROVE'S SPOUT 4TH." Catalogue number 5.

Exhibited in Class 1 (for pedigree Dairy Shorthorn Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, September 14th, 1921; age when photographed, 7 years 1 month.

Prizes won at the London Dairy Show, 1928.—First, Inspection; Third, Milking Trials; the Calvert Challenge Cup; one of the group for the Thornton Cup.

Owner.—A. R. Fish, Esq. Breeder.—T. C. Atkinson, Esq.

Details of thirteen body measurements are given on page 128.

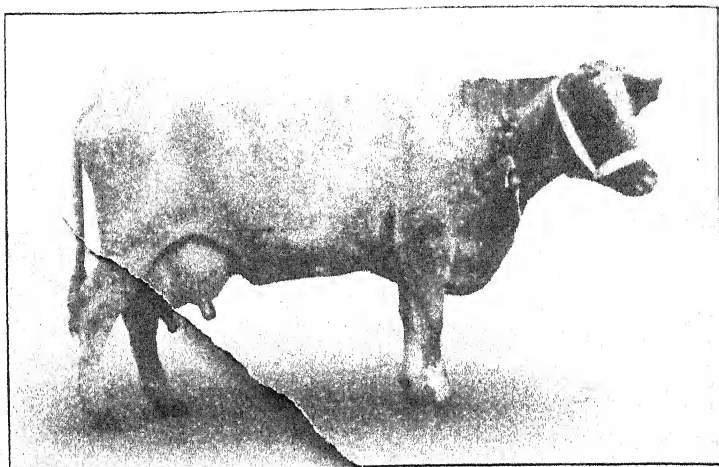
LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter-Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average percentage.	Lactation yield in lbs.
*1	—	—	—	—	—	—	—	—
*2	—	—	—	—	—	—	—	—
3	11 Oct., 1926...	4	287	52	8265½	†	—	—
4	19 Sept., 1927...	4	281	75	8346	†	—	—
†5	13 Sept., 1928...	—	—	—	—	—	—	—

* Not recorded.

† Record incomplete for 5th lactation.

‡ No regular tests.



"LONGHILLS BRIAR." Catalogue number 15.

Exhibited in Class 1 (for pedigree Dairy Shorthorn Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, September 26th, 1922; age when photographed, 6 years 1 month.

Prizes won at the Dairy Show, 1928.—First, Milking Trials; Desborough Cup.

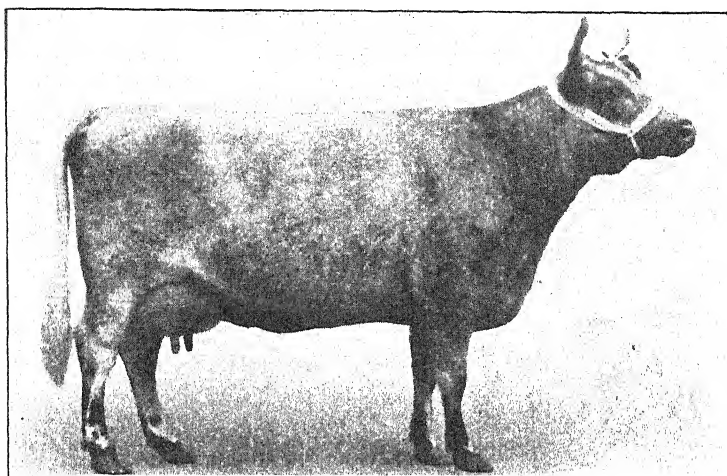
Owner.—Eustace A. Smith, Esq. Breeder.—Exhibitor.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	16 Aug., 1925...	4	332	65	9508½	—	—	—
2	21 Sept., 1926...	4	268½	78½	7046½	—	—	—
3	7 Sept., 1927 ...	4	294	59	8197	—	—	—
*4	29 Aug., 1928...	—	—	—	—	—	—	—

* Record incomplete for 4th lactation.



"DOSSIE." Catalogue number 74.

Exhibited in Class 4 (for non-pedigree Dairy Shorthorn Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, 1922; age when photographed, about 6 years.

Prizes won at the London Dairy Show, 1928.—First, Inspection; First, Extra Inspection; First, Milking Trials; Dairy Shorthorn Association's Prize.

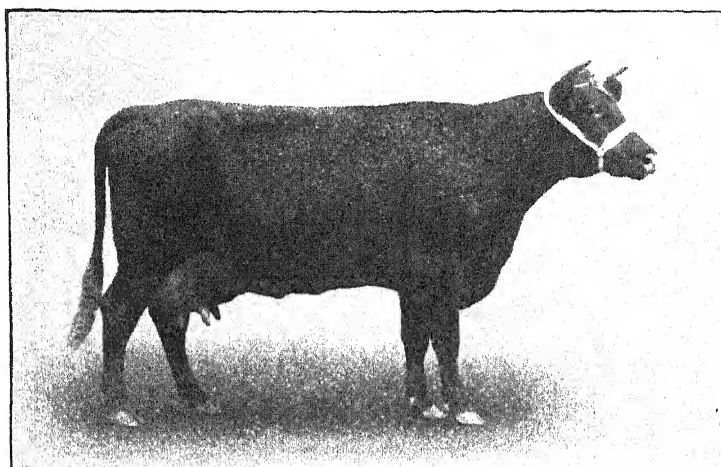
Owners.—Messrs. A. Broome & Sons. Breeder.—Unknown.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNERS.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	21 May, 1924 ...	4	256	137	6588	—	—	—
2	22 June, 1925...	4	315	86	10343½	—	—	—
3	1 Aug., 1926 ...	4	246	71	9063	—	—	—
4	18 June, 1927...	4	326	117	11118	—	—	—
*5	7 Sept., 1928 ...	—	—	—	—	—	—	—

* Record incomplete for 5th lactation.



"BURTON RED ROSE 6TH." Catalogue number 95.

Exhibited in Class 6 (for Lincoln Red Shorthorn Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, August 17th, 1924 ; age when photographed, 4 years 2 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection ; Second, Milking Trials ; First, Butter Tests.

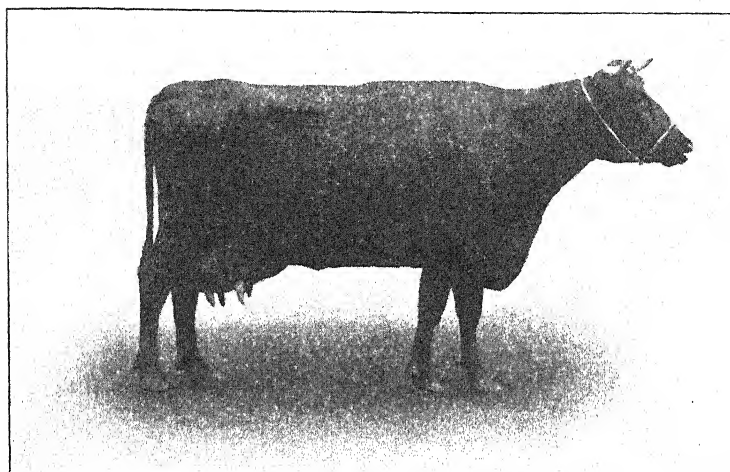
Owners.—Messrs. John Evens & Sons. *Breeders.*—Exhibitors.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNERS.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	6 Sept., 1927...	4	288	89	7418	—	—	—
*2	21 Sept., 1928...	—	—	—	—	—	—	—

* Record incomplete for 2nd lactation.



"LANGFORD DAMSEL 21st." Catalogue number 96.

Exhibited in Class 6 (for Lincoln Red Shorthorn Cows).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, December 9th, 1921; age when photographed, 6 years 11 months.

Prizes won at the London Dairy Show, 1928.—First, Extra Inspection; First, Milking Trials.

Owner.—Sydney Reading, Esq. Breeder.—Exhibitor.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Sucked a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	29 Sept., 1924...	5	312	31	8997½	*	—	—
2	12 Sept., 1925...	4	323	58	8634½	*	—	—
3	2 Oct., 1926 ...	4	310	52	11872½	*	—	—
4	3 Oct., 1927 ...	4	294	62	12100½	*	—	—
†5	27 Sept., 1928...	—	—	—	—	—	—	—

* No regular tests.

† Record incomplete for 5th lactation.



"SUDBOURNE FLOSSIEWIJK." Catalogue number 114.

Exhibited in Class 8 (for British Friesian Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, September 10th, 1920; age when photographed, 8 years 1 month.

Prizes won at the London Dairy Show, 1928.—First, Inspection; First, Extra Inspection; Second, Milking Trials; Second, Butter Tests.

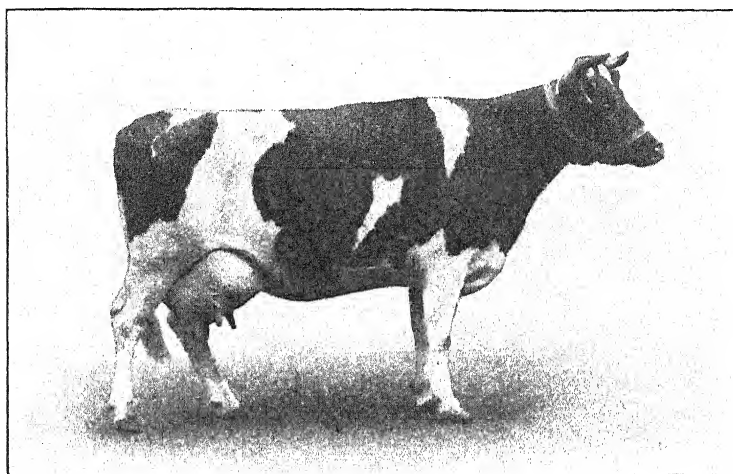
Owner.—Miss E. Martin Smith. Breeder.—Olympia Agricultural Company.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	1 Jan., 1923 ...	4	316	43	1385½	—	—	—
2	30 Dec., 1923...	4	367	298	1683½	—	—	—
3	29 Oct., 1925...	4	513	79	29617	—	—	—
4	17 June, 1927...	4	369	91	24012	9	3.40	816.41
*5	23 Sept., 1928...	—	—	—	—	—	—	—

* Record incomplete for 5th lactation.



"TERLING UNIQUE." Catalogue number 120.

Exhibited in Class 8 (for British Friesian Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, January 14th, 1920 ; age when photographed, 8 years 9 months.

Prizes won at the London Dairy Show, 1928.—Second, Inspection ; First, Milking Trials ; First, Butter Tests.

Owner.—Lord Raleigh. Breeder.—Exhibitor.

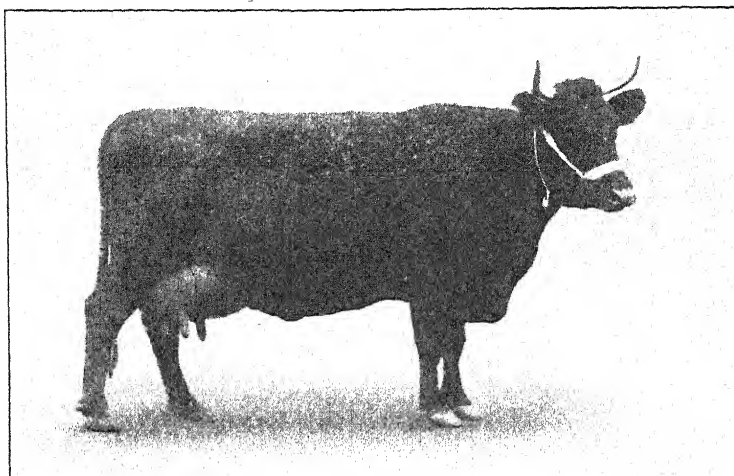
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
*1	June, 1922 ...	—	—	—	—	—	—	—
2	26 Nov., 1923...	4	305	31	7517½	—	—	—
3	31 Oct., 1924 ...	7	305	42	9643	5	3·66	352·93
4	20 Oct., 1925 ...	7	271	68	9769½	5	3·82	373·19
5	1 Oct., 1926 ...	5	235	77	10967½	4	3·43	376·19
6	3 Oct., 1927 ...	4	240	100	7591½	5	3·93	298·35
†7	11 Sept., 1928...	—	—	—	—	—	—	—

* Aborted and was only recorded for a short period.

† Record incomplete for 7th lactation.



"MILKMAID 14TH." Catalogue number 161.

Exhibited in Class 11 (for South Devon Cows).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, September 5th, 1919; age when photographed, 9 years 2 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection; First, Milking Trials; Third, Butter Tests; South Devon Challenge Cup.

Owner.—George Wills, Esq. *Breeder.*—W. S. Harris, Esq.

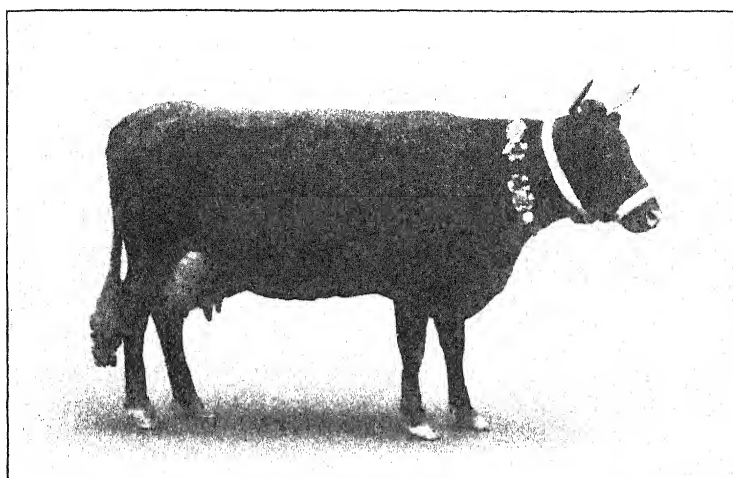
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	Unknown ...	—	—	—	—	—	—	—
2	Unknown ...	—	—	—	—	—	—	—
3	Unknown ...	—	—	—	—	—	—	—
4	Unknown ...	—	*177	144	4740½	—	—	—
5	24 May, 1926 ...	4	315	143	7847½	—	—	—
6	29 Aug., 1927 ...	4	323	63	8852	6	4.51	399.23
†7	22 Sept., 1928...	—	—	—	—	—	—	—

* Part of 4th lactation yield.

† Record incomplete for 7th lactation.



"FOREMAN 3RD." Catalogue number 164.

Exhibited in Class 13 (for Dairy South Devon Cows).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, unknown; age when photographed, unknown.

Prizes won at the London Dairy Show, 1923.—Second, Inspection; First, Milking Trials; First, Butter Tests; Spencer Challenge Cup, National Butter Challenge Cup, Silver Cup for Dairy South Devons, Reserve Supreme Individual Championship.

Owners.—The Seale Hayne Agricultural College. *Breeder.*—Unknown.

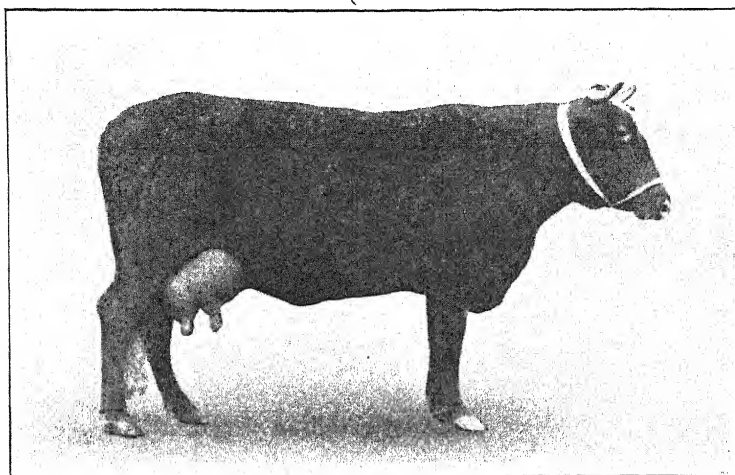
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—
3	April, 1927 ...	6	305	52	13525	*	—	—
†4	27 April, 1928...	4	—	—	—	—	—	—

* No official tests.

† Record incomplete for 4th lactation.



“ALICE 50TH.” Catalogue number 170.

Exhibited in Class 13 (for Dairy South Devon Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, June 16th, 1921 ; age when photographed, 7 years 4 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection ; First, Extra Inspection ; Second, Milking Trials ; Reserve for Silver Cup for Dairy South Devons.

Owner.—Peter Cocks, Esq. *Breeder.*—The late R. E. Cocks.

Details of thirteen body measurements are given on page 128.

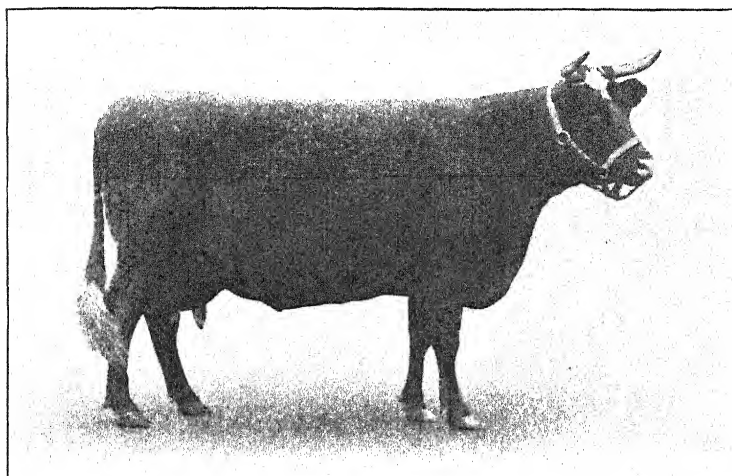
LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
*					†			
?	20 June, 1928.							

* Only one calving date received.

† Yearly milk records (Oct. 1st to Oct. 1st) were as follows :—

1925-26, 7170½ lbs. ; 1926-27, 7860 lbs. ; 1927-28, 9169½ lbs.



"WRAXALL DARLING 3RD." Catalogue number 171.

Exhibited in Class 14 (for Devon Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, January 25th, 1921; age when photographed, 7 years 9 months.

Prizes won at the London Dairy Show, 1928. First, Inspection; First, Extra Inspection; First, Butter Tests.

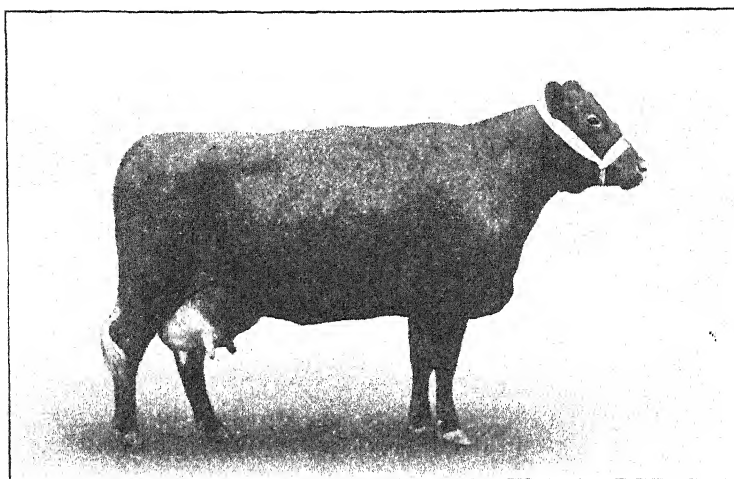
Owner.—Major H. B. Nicholson. *Breeder.*—The late W. G. Busk.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	2 March, 1924...	15	296	37	6323½	*	—	—
2	13 Feb., 1925 ...	12	274	69	5767	*	—	—
3	3 Feb., 1926 ...	8	288	92	6534½	*	—	—
4	26 Feb., 1927 ...	13	302	46	7011½	*	—	—
5	22 Feb., 1928...	10	324	—	9580½	*	—	—

No regular tests.



"BRETENHAM BERTHA." Catalogue number 174.

Exhibited in Class 15 (for Red Poll Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, January 17th, 1922; age when photographed, 6 years 9 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection; First, Milking Trials.

Owner.—N. A. Heywood, Esq. Breeder.—Sir Courtenay Warner.

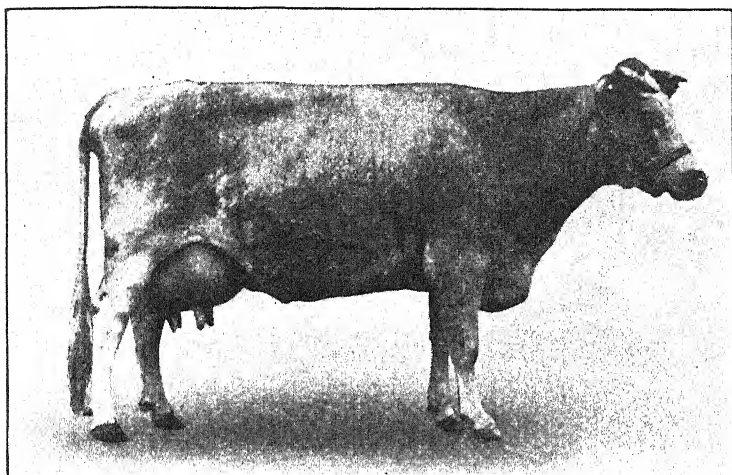
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average percentage.	Lactation yield in lbs.
1	1 Jan., 1925 ...	5	271½	35½	8394	*	—	—
2	9 Nov., 1925 ...	5	267	67	6956½	*	—	—
3	14 Oct., 1926 ...	5	306½	43½	10712½	*	—	—
4	4 Oct., 1927 ...	4	260½	64½	10692	*	—	—
†5	28 Aug., 1928...	—	—	—	—	—	—	—

* No regular tests.

† Record incomplete for 5th lactation.



"SEAGRY ALICE." Catalogue number 215.

Exhibited in Class 18 (for Blue Albion Cows).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, unknown; age when photographed, unknown.

Prizes won at the London Dairy Show, 1928.—First, Inspection; First, Extra Inspection; First, Milking Trials.

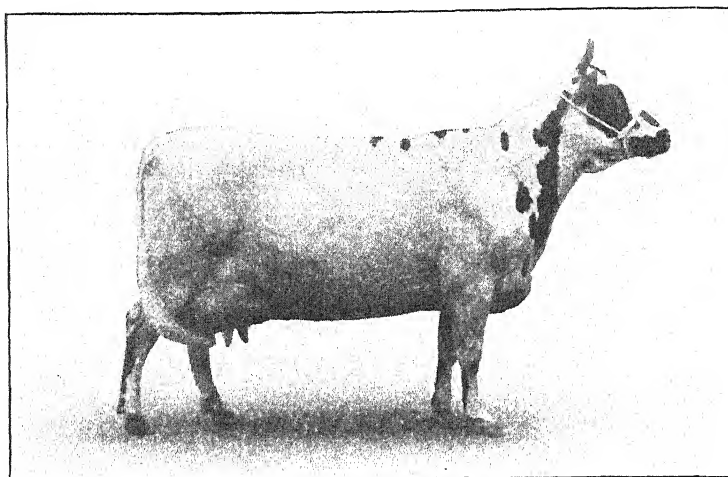
Owner.—R. H. A. Holbech, Esq. Breeder.—Unknown.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	3 Nov., 1925 ...	4	228	87	5599½	—	—	—
2	18 Sept., 1926...	4	263	87	10356	—	—	—
3	7 Sept., 1927 ...	4	252	88	10546½	—	—	—
*4	16 Aug., 1928...	—	—	—	—	—	—	—

* Record incomplete for 4th lactation.



"HARLEYHOLM JENNY 3RD." Catalogue number 225.

Exhibited in Class 21 (for Ayrshire Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, May 21st, 1921; age when photographed, 7 years 5 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection; First, Extra Inspection; Second, Milking Trials; Second, Butter Tests; one of the group for the Bledisloe Challenge Trophy; Reserve for Shirley Challenge Cup; Reserve for Rowallan Challenge Cup.

Owners.—Messrs. Jones & Watson. *Breeder.*—W. Adamson, Esq.

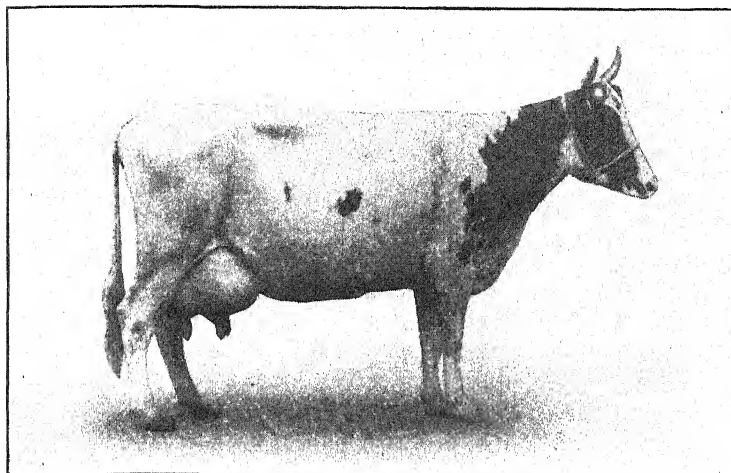
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNERS.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average percentage.	Lactation yield in lbs.
1	1 Feb., 1924 ...	—	307	62	10720	11	3.74	400.93
2	4 Feb., 1925 ...	—	305	126	11300	11	3.74	422.62
3	11 April, 1926...	—	349	174	13520	12	3.55	479.96
*4	16 Sept., 1927...	—	—	—	—	—	—	—
†5	28 Sept., 1928...	—	—	—	—	—	—	—

* No record received for 4th lactation.

† Record incomplete for 5th lactation.



"BARGOWER EVA." Catalogue number 244.

Exhibited in Class 21 (for Ayrshire Cows).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, May 6th, 1921; age when photographed, 7 years 6 months.

Prizes won at the London Dairy Show, 1928.—Second, Inspection; First, Milking Trials; First, Butter Tests; the Rowallan Challenge Cup; B.D.F.A. Individual Championship Challenge Trophy; Reserve for the Spencer and the Barham Challenge Cup; one of the group for the Bledisloe Challenge Trophy.

Owner.—John N. Drummond, Esq. *Breeder.*—Exhibitor.

Details of thirteen body measurements are given on page 128.

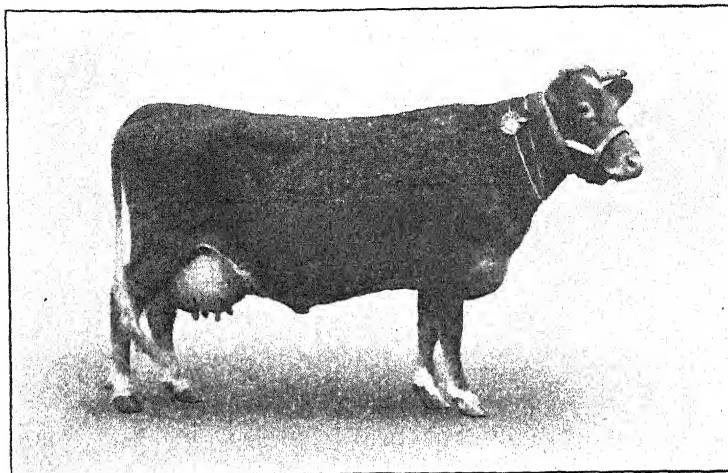
LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
*1	1924	—	—	—	—	—	—	—
2	Feb., 1925 ...	—	309	167	11610	17	4·06	471·37
3	23 May, 1926 ...	—	289	170	14470	15	4·01	580·25
†4	25 Aug., 1927...	—	—	—	—	—	—	—
‡5	30 Sept., 1928...	—	—	—	—	—	—	—

* Aborted, and was not recorded.

† Not recorded owing to illness after calving.

‡ Record incomplete for 5th lactation.



"FROOMES ISABEL 2ND." Catalogue number 262.

Exhibited in Class 23 (for Guernsey Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, May 15th, 1922; age when photographed, 6 years 5 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection; Third, Milking Trials.

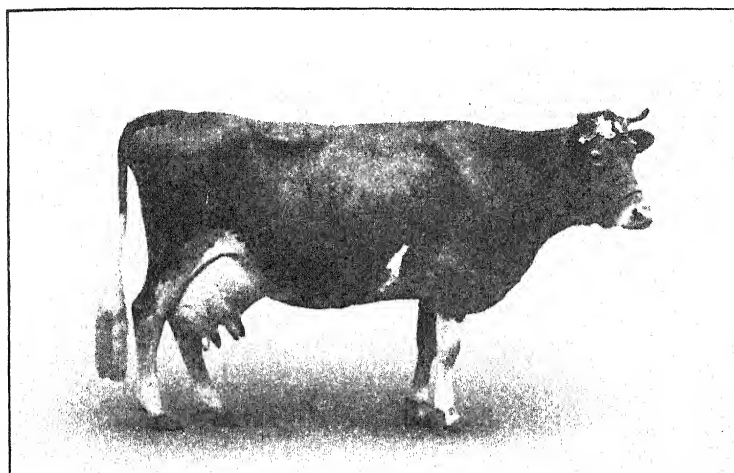
Owner.—R. Pearce Gould, Esq. *Breeder.*—G. H. Froome, Esq.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	17 March, 1924	11	576	88	9305½	4	5.05	469.92
2	21 Jan., 1926 ...	5	397	31	8118	8	4.66	378.30
3	30 March, 1927	4	295	57	8540½	5	4.89	417.64
*4	20 March, 1928	—	—	—	—	—	—	—

* Record incomplete for 4th lactation.



"SOUTHERN STARRETTE." Catalogue number 265.

Exhibited in Class 23 (for Guernsey Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 25th, 1928.

Date of birth of Cow, December 10th, 1920; age when photographed, 7 years 10 months.

Prizes won at the London Dairy Show, 1928.—Second, Inspection; First, Milking Trials; Second, Butter Tests; Stagenhoe Challenge Cup.

Owner.—Lord Remnant. Breeders.—Messrs. Lephard and Hale.

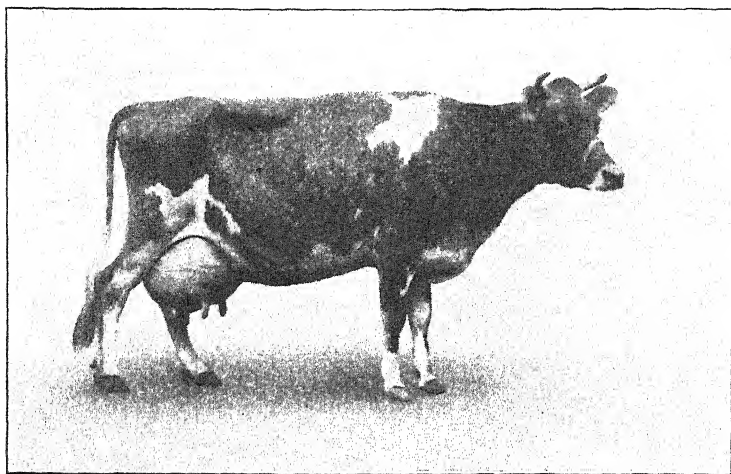
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
*1	—	—	—	—	—	—	—	—
2	7 April, 1924 ...	13	336	41	11390½	7	4.57	520.56
3	2 May, 1925 ...	4	339	37	10160½	6	4.53	460.27
4	17 May, 1926 ...	4	324	60	9804	8	4.71	461.77
5	9 June, 1927 ...	4	391	64	12241½	8	4.42	541.05
†6	10 Sept., 1928...	—	—	—	—	—	—	—

* Not recorded.

† Record incomplete for 6th lactation.



"SIXTY FIVE." Catalogue number 278.

Exhibited in Class 26 (for Jersey Cows born on or previous to August 1st, 1923).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, July 24th, 1922 ; age when photographed, 6 years 3 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection ; First, Milking Trials ; Second, Butter Tests ; National Milk Challenge Cup.

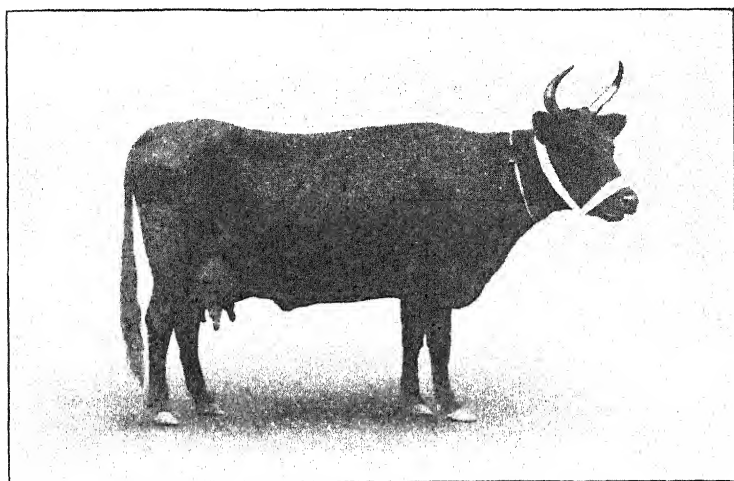
Owner.—H. Cecil Pelly, Esq. *Breeder.*—W. C. Gruchy, Esq.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation.	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	19 Sept., 1924...	5	304	76	6224½	—	—	—
2	9 Oct., 1925 ...	17	280	38	5794½	—	—	—
3	7 Sept., 1926 ...	25	261	86	8472½	5	5.59	473.61
4	14 Sept., 1927...	4	288	67	6086	6	5.47	332.90
*5	6 Sept., 1928 ...	—	—	—	—	—	—	—

* Record incomplete for 5th lactation.



"WADLANDS SWEET CLOVER." Catalogue number 328.

Exhibited in Class 29 (for Kerry Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, August 31st, 1923 ; age when photographed, 5 years 2 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection ; First, Milking Trials ; British Kerry Cattle Society's Challenge Cup.

Owner.—J. W. Towler, Esq. Breeder.—Exhibitor.

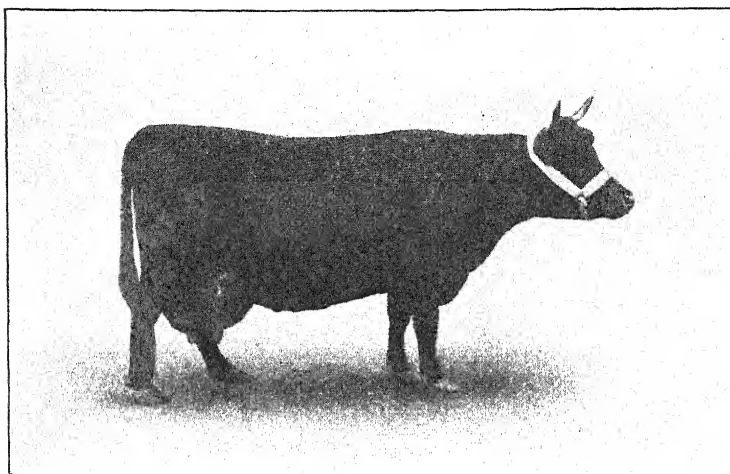
Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average per-centage.	Lactation yield in lbs.
1	22 May, 1926 ...	4	302	129	4513	*	—	—
2	31 July, 1927...	4	325	96	6033½	*	—	—
†3	28 Sept., 1928...	—	—	—	—	—	—	—

* No regular tests.

† Record incomplete for 3rd lactation.



"GRINSTEAD TAXUS." Catalogue number 338.

Exhibited in Class 31 (for Dexter Cows).

British Dairy Farmers' Association official photograph, taken on October 24th, 1928.

Date of birth of Cow, June 19th, 1921 ; age when photographed, 7 years 4 months.

Prizes won at the London Dairy Show, 1928.—First, Inspection ; First, Milking Trials ; First, Butter Tests ; Nutt Challenge Cup.

Owner.—Lady Loder. *Breeder.*—Exhibitor.

Details of thirteen body measurements are given on page 128.

LACTATION MILK RECORDS COMPILED FROM INFORMATION
SUPPLIED BY OWNER.

No. of Lactation	Calving Date.	No. of days the Cow			Lactation milk yields, lbs.	Summary of Butter Fat Tests.		
		Suckled a Calf.	Was Recorded (excluding Suckling period).	Was dry.		No. of complete day tests.	Average percentage.	Lactation yield in lbs.
1	15 Aug., 1923...	4	307	5	4274½	—	—	—
2	26 June, 1924...	4	282	63	3408½	—	—	—
3	10 June, 1925...	9	297	68	5745½	5	4·18	240·16
4	19 June, 1926...	4	355½	59½	7588	6	4·01	304·28
5	12 Aug., 1927...	4	306	73	6392½	5	3·82	244·20
*6	29 Aug., 1928...	—	—	—	—	—	—	—

* Record incomplete for 6th lactation.

INTER-COUNTY CLEAN MILK COMPETITION, 1927-28.

By C. P. ALMOND.

IN reporting on the British Dairy Farmers' Association Inter-County Clean Milk Competition it is fitting to observe in the first instance that a striking feature of the better milk campaign, which has been waged in this country for the past decade, is the success which has attended the holding of county clean milk competitions. Such competitions, the first of which was held in Essex in 1920, are now held yearly in most counties, and are a central feature of the county schemes for helping the dairy farmer to produce a first-class article. These schemes are part of the agricultural education work carried out with the approval of the Ministry of Agriculture, and include, in addition to clean milk competitions and routine advisory and instructional work, provision for clean milk demonstrations and milkers' competitions. The work has shown clearly that a sure way of securing the best milk is to initiate farmers and their employees into the mysteries of the circumstances that affect milk and to stimulate them to a sense of responsibility for cleanly production.

In 1925, the British Dairy Farmers' Association, feeling that no stone should be left unturned to further the movement for clean milk production, decided to take the competitive element a stage further and to institute an Inter-County Clean Milk Competition. A scheme was, therefore, prepared which provides for a yearly competition between counties in regard to their measurable progress in clean milk production, points being allocated according to a set scale. This scale takes into account not only the results of county clean milk competitions but also clean milk demonstrations on farms, milkers' competitions and the number of licences issued for the production of "graded" milk under the Milk (Special Designations) Order, 1923.

The first Inter-County Competition, in which Cornwall was the leading county, was held during 1926-27, and was reported in last year's issue of this JOURNAL. The scheme was found to work well in practice, and, in the main, was left unchanged for the second competition which was held from 1st July, 1927, to 30th June, 1928. The few minor alterations that were made were concerned with the number

of points allocated for clean milk competitions and milkers' competitions, such changes being made with a view to securing the fairest possible scoring between counties.

Eight counties competed in 1927-28, as compared with 11 in 1926-27, but as an indication of the extent of the competition the following facts must be borne in mind: (1) In these eight counties there were 261 herds with 8,573 cows, included in clean milk competitions which lasted for at least six months; for each herd entered nine samples of milk were taken and examined for bacterial contamination, keeping qualities, fat and sediment; advisory visits of instruction were paid by members of the County Agricultural Education staffs, and at least two surprise visits of inspection were carried out on each farm; (2) 819 milkers, most of whom received preliminary instruction in improved methods, took part in milkers' competitions; (3) 5,250 *bona fide* farmers attended clean milk demonstrations held on farms; and (4) 183 producers held licences for the production of "graded" milk, of whom 34 took out such licences for the first time during the competition year.

The competition was won by Essex, their victory being a striking example of the excellent results attendant on co-operation and concentration. The county staff worked hard and successfully, and they had valuable assistance from the Public Health Department and the Essex branch of the National Farmers' Union. Thus 23 clean milk demonstrations on farms were held throughout the county, and the registered number of attendances of *bona fide* dairy farmers almost equalled the number of dairy farmers registered in the county. Most of the demonstrations received considerable local Press publicity, and interest and enthusiasm among producers and their employees was fully aroused. It was this aspect, coupled with excellent results from other activities, which gained Essex the coveted first place. Cornwall, the runners up, were beaten by only a small margin. Once again their county competition and milkers' competitions were almost models of perfection. The third place was again taken by Berkshire; this county has more producers of Grade "A" (T.T.) milk than any other, and despite the limited staff available for instructional work, the work carried out in connection with the county competition is always of a high standard.

Suffolk were fourth and Wiltshire fifth, the remaining entrants being Buckinghamshire, Surrey and Warwickshire. In all these counties some excellent work was performed, and throughout the competition better results obtained than in the first year. There were numerous cases, for example, of bacterial counts lower than 1,000 per c.c. and *B. coli* absent in 1 c.c.; the average keeping quality of the milk examined ranged from 2½ to 4 days (a fact that will be specially appreciated by housewives), and Inspecting Judges were unanimous in praising the efforts of producers to improve their methods.

A statement showing the system of marking and the marks awarded to the leading counties is given below :—

	Essex.	Cornwall.	Berkshire.
COUNTY CLEAN MILK COMPETITIONS.			
For each herd in excess of 30 ... 5 points	70	—	—
For each herd competing for first time 5 ..	65	70	35
In a competition embracing not less than 20 herds, for each 1 per cent. of herds gaining not less than 75 per cent. of possible marks for inspection 5 ..	455	318	437
Ditto for Bacteriological Count 5 ..	432	500	458
Ditto for absence of <i>B. Coli</i> ... 5 ..	409	477	458
Ditto for keeping quality ... 5 ..	364	477	125
Ditto for fat 1 point	59	91	71
Ditto for absence of sediment ... 1 ..	95	100	100
CLEAN MILK DEMONSTRATIONS.			
On the relationship of the total number of attendances of <i>bona-fide</i> farmers at clean milk demonstrations held on farms to the total number of dairy farmers in the administrative area. For each 1 per cent. 10 points	980	359	109
MILKERS' COMPETITIONS.			
For each competitor gaining not less than 75 per cent. possible marks... 2 points	342	576	110
For each 1 per cent. of competitors gaining not less than 75 per cent. possible marks 3 ..	285	287	289
LICENSED PRODUCERS.			
For each licensed producer of Certified Milk 5 points	25	—	30
For each licensed producer of Grade "A" (T.T.) Milk 5 ..	60	10	140
For each licensed producer of Grade "A" Milk 3 ..	120	57	—
For each producer taking out a licence for Graded Milk for the first time, during the year of competition 5 ..	65	25	10
	3,826	3,347	2,372

The Cup and Prizes were again presented by the Right Hon. Walter Guinness, Minister of Agriculture and Fisheries, at the Dairy Show, before a large and representative gathering. After complimenting the Association on the institution of the competition, and the leading counties on their performances, Mr. Guinness said he hoped there would be more entries in future years, and, in particular, he would

like to see counties from the North of England and Wales in the competition. The awards were as follows :—

Winning County (Essex) : The Stapleton Cup.

Leading Competitor in Essex Clean Milk Competition : Lord Rayleigh, £50. (Mr. G. M. Strutt attended to receive this cheque.)

Leading Competitor in Cornwall Clean Milk Competition : Mr. R. J. Dunstan, £25.

Leading Competitor in Berkshire Clean Milk Competition : Mr. E. G. W. Wilson, £10.

Head Cowmen of the above three competitors, Mr. W. A. Lee, Mr. H. M. Clayton and Mr. E. Downing, £10, £8 and £6, respectively.

The value of these competitions lies not only in securing the practice of improved methods by the producer and his staff, but in the resultant Press publicity for better milk and in the increased confidence in the minds of the consuming public which these circumstances tend to encourage.

Moreover, in connection with efforts to promote the production of a higher quality milk through the educational influence of clean milk competitions, it is very gratifying to find an increasing interest being taken by the distributive trade. In many cases "the trade" has provided definite assistance either by contributing trophies, or by offering to those competitors who reach a required standard of merit, and whose milk they regularly purchase, a higher payment in the form of a defined bonus.

The offering of a bonus for milk of proved higher hygienic quality is becoming more widespread each year and, indeed, it would seem that the time is fast approaching when considerable quantities of milk will be bought and sold according to the keeping quality.

ANNUAL REPORT OF THE CONSULTING CHEMIST.

T. J. DRAKELEY, PH.D., M.Sc., F.I.C., F.C.S.

DURING the year 1928, the number of samples submitted by members for examination again showed an increase over the number for the previous year; but, despite this improvement, there are still considerable opportunities for development in this direction, especially considering the present membership and the additional privileges which the Council have granted during the past few years.

It should be recalled that the Council extended the chemical privileges of membership by materially reducing all the fees for the analysis and examination of samples of dairy products, foods, soils, manures, &c.; and also granted to each member, whose subscription for the current year was paid, the additional privilege of being entitled, free of charge, to one analytical examination of a dairy product. Such increased privileges of membership of the Association will remain in operation during the year 1929, and should, undoubtedly, be an inducement to non-members to join the Association.

The samples submitted for analysis have been very varied in character. Whilst the major portion of the work has been concerned with the routine testing of milk samples, there have been samples of soils, manures, water and feeding stuffs requiring special investigation.

It may be of interest to note that samples of activated sludge have been submitted for an investigation of their manurial values, and whilst the results of most of the analyses have been discouraging a few have shown greater promise and appear to warrant further investigations with a view to development of the possibilities.

For the first time for many years, samples of butter have been received which were adulterated with foreign fats.

In order to check the efficiency of bottle-washing machines in sterilising the milk-bottles, a number of bacteriological examinations of washed bottles has been made, and it is remarkable how uniformly sterile are the bottles from the plants.

BACON PIGS, BACON AND HAMs, DAIRY SHOWS, 1927-28.

By W. J. GRANT.

It was interesting to hear the many varied and distinctly opposite opinions expressed by the breeders and feeders of Bacon Pigs, those who cure Bacon for *quick* consumption, provision merchants whose shops are in districts wide apart, with last, but by far the most important and valuable practical information and opinion, was that candidly given by those who were purchasers of Bacon for their own household week in and week out all the year round. Such was one of the experiences and recollections in connection with the Bacon Pig and Bacon and Ham Classes in the Gilbey Hall during the Dairy Shows of 1927-28.

Taken on the whole the entries both in the Bacon Pig, Bacon, and Classes for Hams were of greater merit and excellence at the Dairy Show of 1927 than at that of 1928, with the exception of the Class for Smoked Bacon, four sides, mild cured in Wiltshire style, with Hams attached, which was of outstanding excellence at the 1928 Show.

The Classes for Colonial Bacon, I venture to say, are entitled to and should receive much better support than they are getting. From the way in which the Bacon exhibited in the Colonial Classes each year, it would appear that neither the pig farmer or the curer in the Colonies have yet appreciated the fact that it is more than worth their while to breed and feed an animal that will supply a type of bacon for which there will be an outlet and demand where bacon that would keep more than a month is wanted. Many of the sides shown were over age, not well cured, while, on the other hand, there were a few sides that might be taken as a useful object lesson as to what might be accomplished, when the determination has been arrived at to create a market and demand in the Old Country for an article of food that deserves appreciation.

The Classes for Hams were of great similarity each year, some of those put up for competition, especially in the Selling Classes, were not examples to covet. While, on the other hand, many hams, well cured, probably 12 months, sold at a moderate price owing to their weighing from 19 to 20 lbs. in weight. Those who purchased these hams were, I found, well aware of the fact that with proper care and a judicious use of the knife, hams such as those described would, in the hands of a good housewife, be "something" to fall back upon for many a long day to come.

The number of entries in the Classes for Bacon and Hams at the Dairy Shows of 1927 and 1928 were as follows:—

	BACON.	1927.	1928.
Smoked, Four Sides, mild cured in Wiltshire style, with Ham attached	7	9	
Pale Dried, Four Sides, mild cured in Wiltshire style, with Ham attached	7	8	
Two Sides of Bacon Smoked, and Two Sides of Bacon Pale Dried, and Two Hams Smoked and Two Hams Pale Dried, weight of the Sides not less than 56 lbs. and not more than 68 lbs. each. The Hams not less than 12 lbs. or more than 20 lbs. each	7	6	
Colonial Bacon	10	7	
	HAMS.		
Pale Dried, Four Hams, long cut, of Winter or Spring Cure, not over 14 lbs. in weight ...	11	8	
Pale Dried, Four Hams, long cut, of Winter or Spring Cure, over 14 lbs. in weight	10	8	
Smoked, Four Hams, long cut, mild cured, not over 10 weeks cured, not over 15 lbs. weight	9	8	
Pale Dried, Four Hams, long cut, mild cured, not over 10 weeks cured, over 15 lbs. weight ...	11	8	
Selling Class for Hams, any variety. Two Hams	14	17	
	<u>86</u>	<u>79</u>	

Bacon Pigs that were delivered for the purpose of being killed and cured for Bacon by Messrs. C. & T. Harris (Calne), Ltd., Calne, Wilts, on September 17th, 1927, and September 15th, 1928, and afterwards delivered at the Dairy Show, Royal Agricultural Hall, Islington, on the 17th October, 1927, and the 22nd October, 1928:—

Six Pigs, three Hogs and three Gilt of any pure breed that had been farrowed on or after the 1st March to compete for the "Whitley" Cup (1927, 18 pigs) (1928, 60 pigs)	3	10	
Two Pigs, one Hog and one Gilt, farrowed on or after 1st March by a Registered Sire and out of a Registered Dam of the same Breed, to compete for the "Beale" Challenge Cup (1927, 22 pigs) (1928, 20 pigs)	11	10	
Two Pigs, First Cross, one Hog and one Gilt, farrowed on or after 1st March by a Pure-bred Sire and out of a Pure-bred Dam, to compete for the "Bledisloe" Challenge Bacon Cup (1927, 10 pigs) (1928, 8 Pigs)	5	4	
	<u>19</u>	<u>24</u>	

Again the three Classes of such outstanding importance to both the breeders and feeders of pigs, especially in the Home Counties and the South and West of England, have been the means of creating a fair amount of criticism, favourable and adverse.

It might be well to most respectfully remind those, whether they are breeders, feeders of bacon pigs, curers or others, that the sole and only object of Mr. S. R. Whitley, to whom the gratitude of all pig breeders is due for thinking out and creating these important classes, was for the sole and only purpose of doing something that would in a thoroughly practical way encourage the much needed uniformity in size and quality of the animals required by the curers, that would enable them to supply the British consumers with bacon for their breakfast tables unequalled by that produced anywhere else.

The Council of the British Dairy Farmers' Association, being anxious to do all in its power to encourage the pig industry, which is closely associated with cheesemaking, and so as to avoid any uncertainty as to the price, each competitor is paid the week after the animals are killed the current price for best bacon pigs on the week in which they are killed.

In 1927 the arrangement answered admirably, but for the Dairy Show of 1928, many of the animals that were sent to Calne might be fairly described as large porkers on the lean side, that it would be impossible to convert into saleable sides of bacon.

The pigs sent to Calne for the competition in 1927 were fairly uniform, and although the Gloucestershire Old Spots were considered to be too fat for the London West End trade they were, without doubt, the best of the pure-bred pigs competing.

In the Class for Cross-bred Pigs, Mr. H. H. Pickford's pair, Large White and Large Black, were the best pair of pigs killed at Calne on the 17th September, 1927, and certainly ran very close for the "Harris" Cup for the best sides in the three Classes.

It would appear that some of the breeders and feeders who sent pigs to be killed and cured at Calne for the Bacon Competitions at the Dairy Show of 1928, did not carefully read the Regulations stated in the Schedule, and, possibly, some of those who entered their animals were influenced by the fact that, whether a prize was won or not, the animals would realise the best market price. This view may be admirable from the exhibitor's standpoint, but it is unfair to the British Dairy Farmers' Association who have to bear any loss that may result from the sale of the bacon.

The above remarks are made as a reminder to those who intend to send pigs for competition at the 1929 Dairy Show, to read carefully the conditions under which the competitions will be carried out.

As the competition in the "Whitley" Challenge Cup was made open to breeders as well as the various Pig Breed Societies there was an increased number of entries, quite the largest since the Class was created, one most interesting result being that for the first time Large Whites competed, and the first, second and third place was secured by Large Whites, shown by their breeders. The opinion formed by those who saw Mr. Alfred Lewis's Large White pigs alive, was confirmed by the Bacon Judges in their report—excellent as Mr. Lewis's pigs were, they were closely followed by the Large Whites from Histon, Cambridgeshire. An unfortunate, but forcible, fact was an increase in the number of pigs that were killed in 1928 of tuberculosis. Some of those whose opinion I have sought on this subject are of opinion that this trouble is more frequent when separated milk is used for feeding pigs.

The Show Committee of the British Dairy Farmers' Association and the writer of this article are much indebted to Messrs. C. & T. Harris (Calne), Ltd., for the courteous and very thorough manner in which each year they have assisted to carry out these competitions.

In conclusion, may I venture to suggest as one who has always believed that a Britisher if he makes up his mind to do so, and sticks to it, will go through and come out on top. Therefore, if the breeders and feeders of Bacon Pigs and the Curers could only arrive at a definite understanding, such as would be of mutual advantage in different parts of England, as to the type of animal required, combined with a regulated delivery, that there is yet a good outlook for both the pig breeder and the curer when they truly realise that their interest is a mutual one.

Exhibitor's Name.	Entry No.	No. of Pigs.	Breed.	Average Age.	Average Live Weight.	Live Weight.	Dead Weight.
CLASS 87.							
Gloucester Old Spot Pig Society	1209	6	Gloucester Old Spot ...	Months. Days.	lbs.	lbs.	lbs.
National Long White Lop-eared Pig Society	1210	6	Long White Lop-eared	6 7	240.8	1445	1189
				5 15	175.5	1053	832
Large Black Pig Society	1211	6	Large Black ...	6 4	198.1	1180	933
CLASS 88.							
Major-Gen. R. I. Mullens	1212	2	Large White ...	6 1	160.0	320	248
Bennett & Howard	1216	2	Gloucester Old Spot ...	6 —	232.5	465	375
G. H. Eustice	1217	2	Long White Lop-eared	5 15	198.5	397	317
W. Brooks & Sons	1218	2	Large Black ...	6 10	229.0	458	365
R. J. Wythers	1219	2	Large White ...	6 6	183.0	366	287
J. H. White	1220	2	Gloucester Old Spot ...	6 6	235.5	471	385
Mrs. Vorke	1221	2	Wessex Saddleback	6 14	192.5	385	302
F. H. Rea	1222	2	Gloucester Old Spot	6 13	221.0	442	356
CLASS 89.							
Australian Training Farms	1223	2	Lar. Black & Berkshire	5 25	152.0	304	220
Cathedral Dairy Co.	1224	2	Lar. White & M. White	6 14	199.5	390	309
J. H. Ismay	1225	2	Lar. White & Berkshire	4 28	214.0	428	344
H. H. Pickford	1226	2	Lar. White & Lar. Black	6 10	208.5	417	321

Dairy Show,

Exhibitor's Name.	Entry No.	No. of Pigs.	Breed.	Average Age.	Average Live Weight.	Live Weight.	Dead Weight.
CLASS 86.							
Gloucester Old Spot Pig Society	1080	6	Gloucester Old Spot ...	Weeks. Days.	lbs.	lbs.	lbs.
Large Black Pig Society	1081	6	Large Black ...	25 3	191.1	1147	911
National Long White Lop-eared Pig Society	1082	6	Long White Lop-eared	27 2	186.3	1118	874
				27 6	215.0	1204	1073
J. Pierpont Morgan	1083	6	Large White ...	27 5	175.5	1053	821
Chivers & Son	1085	6	Large White ...	26 2	179.8	1070	816
J. Fricker, Junr.	1086	6	Berkshire ...	27 1	212.8	1277	1025
A. Lewis	1087	6	Large White ...	27 3	194.0	1164	932
W. A. Bindley	1088	6	Berkshire ...	27 3	143.6	862	649
Chivers & Son	1089	6	Middle White ...	27 5	152.6	916	678
CLASS 87.							
J. Pierpont Morgan	1090	2	Large White ...	27 5	158.5	317	248
Bennett & Howard	1091	2	Gloucester Old Spot ...	27 5	199.0	398	308
W. A. Bindley	1092	2	Berkshire ...	26 4	157.5	315	239
Lt.-Col. Hart	1093	2	Large White Ulster ...	26 5	176.5	353	277
Chivers & Son	1094	2	Large White ...	28 2	193.5	387	291
G. H. Eustice	1095	2	Long White Lop-eared	27 6	197.0	394	309
J. Fricker, Junr.	1096	2	Berkshire ...	25 3	204.5	409	326
E. A. Crookes	1097	2	Large White ...	28 1	197.5	395	304
Chivers & Son	1098	2	Large White ...	25 4	181.5	363	278
F. H. Rea	1099	2	Gloucester Old Spot ...	27 6	215.0	430	330
CLASS 88.							
County Breeding Estates, Ltd.	1100	2	Lar. White & Lar. Black	28 1	211.5	423	326
J. H. Ismay	1101	2	Lar. White & Berkshire	28 2	178.0	356	278
H. H. Pickford	1102	2	Lar. White & Lar. Black	27 4	201.0	402	306
W. Woodland	1103	2	Lar. White Ulster & Lar. White Lop-eared	28 1	206.0	412	323

Per cent. Loss Live Weight to Dead Weight.	Bacon Weight.	Per cent. Loss Live Weight. to Bacon Weight.	Correct Proportion of Fat to Lean including Thickness of Sireaky.	Suitability of Side, Quality of Meat, Bone, &c.	Fat on Back, Lean Meat, Proportion of Lean to Fat.	Firmness of Fat.	Fineness of Rind.	Deduct for Seedy Cut (or Block Belly) up to 15 Points.	Total. 100 Points.	Awards.
lbs.	lbs.	lbs.	30 points	20 points	30 points	15 points	5 points	15 points		
17.7	891	38.3	26	16	26	15	5	—	88	1st, Whitley Cup.
20.9	616	41.5	24	14	24	13	5	—	80	
21.5	687	42.2	25	18	24	13	4	5	79	
22.5	182	43.1	20	14	20	12	3	—	69	Reserve. 3rd.
19.3	281	39.5	24	16	24	15	4	—	83	
20.1	237	40.3	26	16	24	13	5	—	84	
20.3	276	39.7	24	15	22	12	4	—	70	2nd.
21.5	215	41.2	20	14	20	12	4	—	76	
18.2	292	38.0	26	16	24	15	4	—	85	
21.5	217	43.6	26	14	26	10	4	—	80	1st, Harris Cup. Beale Cup.
19.4	265	40.0	26	18	28	15	5	—	92	
27.6	159	47.6	10	12	20	12	4	—	58	
22.5	227	43.1	22	16	22	12	4	—	76	3rd.
19.6	261	39.0	26	16	24	15	4	—	85	2nd.
23.0	239	42.6	24	18	26	15	5	—	88	1st, Bledisloe Cup

1928.

Per cent. Loss Live Weight to Dead Weight.	Bacon Weight.	Per cent. Loss Live Weight. to Bacon Weight.	Correct Proportion of Fat to Lean including Thickness of Sireaky.	Suitability of Side, Quality of Meat, Bone, &c.	Fat on Back, Lean Meat, Proportion of Lean to Fat.	Firmness of Fat.	Fineness of Rind.	Deduct for Bad Belly up to	Total. 100 Points.	Awards.
lbs.	lbs.	lbs.	30 points	20 points	30 points	15 points	5 points	15 points		
20.5	668	41.7	15	10	20	15	3	—	61	Reserve.
21.8	639	42.8	11	7	14	14	3	—	49	
17.0	803	37.9	19	9	6	14	2	—	48	
22.0	589	44.0	16	11	26	6	3	—	62	3rd.
24.3	600	44.3	17	11	30	6	2	—	66	2nd.
19.7	776	39.2	21	13	12	12	2	10	50	
19.9	688	40.8	20	12	30	10	2	—	74	
24.7	467	45.8	11	6	28	12	3	—	00	1st, Whitley Cup.
25.9	494	46.0	11	8	25	10	3	1	56	
21.7	175	44.7	15	10	26	15	4	—	70	3rd. 2nd.
22.6	222	44.2	16	11	28	15	2	—	72	
24.1	175	44.4	14	9	24	13	3	—	63	
21.5	208	41.0	19	13	20	12	2	—	66	1st, Beale Cup.
24.8	214	44.7	19	13	26	14	3	—	75	
21.5	223	43.4	14	9	15	15	2	—	55	
20.2	245	40.0	17	12	16	12	3	—	60	Reserve.
23.0	222	43.7	17	12	24	12	3	—	68	
23.4	206	43.2	17	12	18	13	3	—	63	
23.2	241	43.9	14	9	12	15	3	—	53	
22.9	239	43.4	23	18	26	14	3	—	84	1st, Bledisloe Cup
21.9	204	42.6	20	16	30	13	3	—	82	Harris Cup.
23.8	217	46.0	19	15	24	13	3	—	74	2nd, Reserve,
21.6	240	41.7	21	17	20	13	3	3	71	Harris Cup. 3rd.

THE DAIRY SHOW OF 1928.

THE JUBILEE SHOW.

By S. R. WHITLEY, J.P.

THE British Dairy Farmers' Association held its 50th Show in the Agricultural Hall, Islington, on October 23rd, 24th, 25th and 26th. Though it was the 50th Show, it was the 52nd year of the Association's activities. Anyone who wishes to know more of the early history of the Show and of the Association should read the most interesting articles by Mr R. H. Evans in the British Dairy Farmers' Association Journal of 1927, and by Mr Holmes Pegler in the Journal of 1924. The work both of the Show and the Association has grown continually from strength to strength, and this 50th Show was no exception to the rule, though the total number of entries was slightly below the high-water mark, which was reached in 1923.

It is interesting to compare the entries at this Jubilee Show with those at the first Dairy Show in 1876, viz :—

				1876.	1928.
Cattle	...	...	...	140	366
Cheese	...	...	...	111	664
Butter	...	...	...	119	476
Roots	...	...	...	21	165
Poultry	...	...	...	473	3,642

In 1927, the entries of cattle and goats had to be cancelled owing to an outbreak of foot and mouth disease within 15 miles of the Agricultural Hall and this, undoubtedly, reacted on the entries of 1928. Right up to the arrival of the cattle it looked as if, contrary to the experience of recent years, this Show would not be troubled by rumours of this dreaded disease, but such good fortune was not to be, for on the day before the opening of the Show, we were informed of a new outbreak in Kent and, eventually, it was necessary to remove eleven cows coming from the infected area from the precincts of the Hall; fortunately, these cows had completed their Milking Trials and Butter Tests before removal, but it was not possible to judge them for Inspection.

During 1927 the Council had decided to cancel the usual Classes for Bulls and to substitute for them classes in each breed for progeny of any particular bull, such progeny to be judged on the points gained in the Milking Trials. As all Cattle Classes were cancelled in 1927, this Show of 1928 was the first from which experience in the working of this scheme could be gained. As a total of 40 entries were made, the scheme bids fair to be successful, though it will probably need alteration and development as time goes on. It has the great advantage of judging dairy bulls by their actual breeding performance, rather than by their appearance which is so often misleading, and the bulls need not now put in an appearance at an already overcrowded Show.

For the first time an experiment was made in the direction of giving each cow a separate stall. This is highly desirable if each cow is to have a fair trial in the tests, but to accomplish it in time throughout the Show is a difficult matter, as possession of the Hall cannot be had until midnight on Tuesday, and quite early on Thursday morning the cows begin to arrive. It is no easy matter to provide even standing accommodation for 200 to 300 cows in just over 24 hours, but eventually single stalls were provided for about one-third of those present, and the arrangements certainly added to the symmetry of the Show and gave each animal a fairer chance to distinguish itself in the trials. It is still an open question whether such stalls could be erected throughout the Show in the time available.

Considering the depression in trade generally, and more particularly in agriculture, the attendance of the public was quite satisfactory, the gate money being £400 in excess of that of the 1927 Show, but still £400 below that of the 1926 Show. The attendance for the four days, exclusive of exhibitors and season ticket holders, amounted to 40,553.

The demand for stand space was as great as ever and business on most stands was reported as fairly brisk, in fact, better than might have been expected in view of the very large exhibit of dairy machinery, &c, organised by the World's Dairy Congress at the Royal Show at Nottingham. As in last year, the Ministry of Agriculture took a large space in the Gilbey Hall for its "Better Marketing" demonstrations. These were well patronised by the public and must be of great service to producers in showing just what present-day markets require. Owing to the illness of the demonstrator and great pressure of work at the National Institute for Research in Dairying it was not possible to arrange a demonstration of the methods required for the production of the cleanest long-keeping milk, such as has been so popular in recent years.

THE FOLLOWING TABLE GIVES COMPARATIVE DETAILS OF THE ENTRIES AT THE DAIRY SHOW OF 1928 WITH THOSE OF THE PAST TWELVE YEARS.

	1913.	1914.	1915.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.
Cattle	286	234	204	292	384	455	515	539	473	470	449	449	366
Milking and Butter Tests ...	265	167	198	334	492	614	760	772	718	700	693	737	563
Goats... ..	110	85	116	115	109	101	91	67	72	48	78	68	53
Poultry	3,840	3,089	2,653	2,736	4,317	4,343	4,398	4,085	4,498	4,355	4,352	3,888	3,642
Pigeons	2,467	2,291	2,735	2,760	3,259	3,272	3,208	3,115	3,027	3,094	3,180	3,098	3,083
Cheese	395	301	271	342	462	406	418	488	486	459	489	688	664
Bacon and Hams	89	67	45	—	34	56	87	89	113	95	94	105	103
Butter	549	371	339	242	286	322	388	401	483	420	430	488	476
Cream	43	27	20	16	19	32	37	33	30	47	30	43	47
Skim-milk, Bread, &c. ...	64	46	65	40	40	No class	No class	No class	No class	No class	No class	No class	No class
Honey, &c.	106	126	77	20	49	63	58	92	102	53	65	56	88
Bottled Fruits and Vegetables ...	—	—	—	—	45	25	26	53	65	33	56	80	34
New and Improved Inventions...	41	24	6	23	14	38	30	37	37	54	50	57	13
Roots	190	59	51	80	144	148	183	190	283	269	271	242	165
Butter making Contests ...	141	97	101	110	86	162	141	129	154	130	131	155	124
Milkers' Contests	137	85	82	77	80	98	44	43	56	51	47	61	44
Junket-making Contest ...	—	—	—	—	7	8	12	23	33	27	28	38	36
Collection of Colonial Produce ...	—	—	—	—	2	2	3	3	1	2	2	—	—
Cow-Judging Contest ...	—	—	—	—	—	—	—	7	4	8	10	9	7
Collection of Produce ...	—	—	—	—	—	—	—	—	8	18	9	9	7
	8,723	7,069	6,963	7,187	9,829	10,150	10,399	10,766	10,643	10,333	10,464	10,271	9,515

CATTLE

With a total entry of 366, there were only 203 able to be present in the Hall. This smaller number enabled the cows to be more comfortably housed, and the accommodation for herdsman and their utensils was not so severely crowded as in recent years.

SHORTHORNS :—

The total entries in the three Pedigree Classes was only 70, against 105 in 1927. They made a good display of Dairy Cattle, but speaking generally, were not considered quite up to the high standard of recent years. The Thornton Cup for the best group of three Shorthorn cows or heifers was won by Mr A. R. Fish, of Preston, Lancashire.

The two Non-Pedigree Classes were again not well filled, and in the class for Cows, only two out of a total entry of seven were forward for judging, but the first prize-winner was an exceptionally good type of Dairy Cow. The Class for Non-Pedigree Cows is probably less in numbers owing to the fact that the Council insists that all cows must have been recorded by an approved Milk Recording Society for the complete year ending September 30th, 1928. In the Heifer Class, with 12 entries, only six paraded before the Judge. The prize-winners were of good Dairy type.

The Class for Lincolnshire Red Shorthorn Cows had only seven entries, with five present, but the quality was distinctly good. The corresponding class for Heifers had ten entries, with six present.

The Section for British Friesian Cows had 28 entries, but an unusually large proportion of absentees somewhat marred the Classes, though they contained several seven and eight galloners. The prize was eventually won by a cow that had twice completed her 2,000 gallons.

Both in the Class for Young Friesian Cows and in that for Heifers, there was a material drop in entries compared with last year, and not much over half of them were able to be present. The Young Cow Class contained the heaviest yielder of the Show, viz., just under nine gallons in the 24 hours.

The Friesian Heifer Class, though somewhat reduced in numbers, was a very good one and contained daughters of many cows that have yielded their 2,000 gallons per annum.

The Thornton Cup for the best group of three Friesian Animals was awarded to Mr. Albert Weightman, of Sunderland.

While the Class for South Devon Cows contained only three entries, with one absent, the Heifer Class had to be cancelled.

The Class for Dairy South Devon Cows was a good one, with seven entries.

The Class for Devon Cows contained three entries, all of which were present, but no award could be made in the Milking Trials as they were not up to the standard of the Breed.

One of the outstanding features of the Show was the splendid collection of Red Polls; perhaps, the best yet seen at Islington, though in the Mature Cow Class only five out of 13 entries were able to parade for judging, and the breed was in consequence debarred from entry for the Bledisloe Trophy.

The Young Cow Class was specially strong and contained many animals of true dual purpose type.

Of Red Poll Heifers there were 11 entries, which made a good class.

In the Blue Albion Cow Class there were five entries, but only two present, and in the Heifer Class only two entries, with one present. This breed has been specially unfortunate ever since it began exhibiting at the Dairy Show owing to foot and mouth disease restrictions.

The Welsh Black Cows were conspicuous only by their absence, though two were entered.

The splendid line of Ayrshire cattle impressed everyone and will long remain in one's memory. The true Dairy type was stamped on every one of them, the fine wedge shape and almost perfect udders being conspicuous throughout. There were 22 entries in the Cow Class and 15 entries in the Heifer Class. It is worthy of note that the first prize in each section was won by an English firm. After a keen struggle the Ayrshire breed was awarded the Bledisloe Trophy, with the Friesian breed as reserve. This is the fourth time the Ayrshire breed has won this Trophy.

The Guernsey entries were only half those of last year, though the quality was distinctly good. Three cows out of four entered paraded in the Mature Cow Class.

In the Young Cow Class, six out of seven entries came out for judging, whilst in the Heifer Class all four entries paraded, and this was, perhaps, the strongest of the Guernsey Classes.

The Jerseys were specially unfortunate in having such a large proportion of animals turned out of the Show owing to foot and mouth disease being declared in the area whence they came, but, in spite of this, they made a creditable show in all three classes. In the Young Cow Class "Postgirl," daughter of the famous 2,000 gallon "Postmistress," was placed second on Inspection, thus showing that it is possible to produce Jerseys true to type even from the highest yielders. In points for the Milking Trials they seemed to leave the Guernseys some way behind.

The Kerry entries, though better than last year, were not so numerous as they used to be, and the competition was not very keen.

The Dexter entries were poor, there being only three in each class, but the points gained in the Milking Trials were quite good considering the size of the animals.

GOATS.

A total entry of 53 Goats is only about half what it used to be eight or nine years ago. Instead of being housed at the top of the hall as usual, the goats found a home alongside the bandstand, and this new position gave general satisfaction.

Nineteen goats were entered for the Milking Trials. The Judge reports that the quality of the exhibits showed a marked improvement, especially with regard to the udders. Some of the goats exhibited were reported to have yielded as much as two gallons in the 24 hours, an extraordinary amount for such small animals, but such a record was not reached at this Show. The Adult Classes were exceptionally good in quality, breed characteristics and milking capabilities, whilst in the Classes for Goatlings, the leading animals were of superlative merit.

CHEESE.

The total number of Cheese entries was the second highest on record, and double shelving had to be adopted, practically, throughout the Show in order to accommodate them. The shelving adopted was considered capable of improvement and will be reconsidered for future Shows.

STILTONS.

Both the classes were well filled and the winning numbers were particularly good. The Judge had no hesitation in awarding the Lord Mayor's Cup to an entry in the class for 18 Cheeses.

CHEDDARS.

The Class for Truckles was well filled and calls for no comment.

The Class for Four Cheddar Cheeses, not less than 40 lbs. each, contained 80 entries as against 72 last year.

The Class for Four Cheddar Cheeses (long keeping), to be made on or before June 30th, had only 13 entries, against an entry of 44 last year.

The Class for 12 Cheddar Cheeses was even larger than that of last year.

Of Cheddars generally, the Judges report difficulty in making their awards because the Scotch and English exhibits are of a somewhat different kind—the English cheese being of a richer nature, while the Scotch are of a milder flavour.

Colonial Cheddars were not quite so numerous as last year. The exhibits showed evenness of quality and evidence of careful grading, though there were no outstanding cheeses, all were of fine quality, having a bold appearance which gives them a distinct advantage when exposed in the retailers' shops. The Hansen Trophy went to New Zealand.

CHESHIRE.

The total number of Cheshire Cheeses exhibited again showed a large increase, but the Class for Novices was slightly down in numbers. There was evidence of care in external appearance and an improvement in internal flavour. The numbers in the Long-Keeping Class have practically doubled, and it would appear that this class is greatly appreciated in Cheshire.

The Class for Factory Cheese (for the best exhibit of factory cheese, to be manufactured at and exhibited by, a recognised cheese factory in the United Kingdom, dealing with a minimum of 500 gallons of milk daily—10 cheeses of not less than 28 lbs. each of any variety) brought 14 entries of fair quality.

The Leicester Cheeses made a better show than last year and the first prize went to a nice exhibit, but the majority of the other entries were discoloured and tainted.

The number of entries in the Class for Lancashire Cheese was disappointing, but the exhibits were of good quality.

Only five entries were made for Derby Cheese, but they were, on the whole, good exhibits.

The Single and Double Glosters were of very good quality and quite up to standard.

The entries in the Caerphilly Class were slightly more than last year, but the Judge reported them as hardly up to standard, with too much moisture in many of them and too loose in the curd, many not being of the true Caerphilly character.

The Class for Wensleydale (Blue-Moulded) brought 7 entries, against five last year. The quality was good.

Both Classes for Smallholder Pressed Cheese (long-keeping and quick-ripening) were well filled. The prize-winning exhibits were of excellent quality, though a great many of the remainder were faulty in flavour.

The Classes for Small Cheddar and Small Cheshire (open to pupils who have attended County Travelling Cheese Schools during 1927 or 1928) were considerably larger than those of last year.

The Inter-County Competition for the best Collection of Smallholder Cheeses, made by persons who have received instruction in cheese making at a County Council Cheese School during 1925-1928, still seems to languish and produced only two entries. Monmouthshire (Instructress, Miss M. M. Trippe) won the Shield, with Devonshire (Instructress, Miss E. Bray) as reserve.

The Class for Cream Cheese, made from pure cream only, brought 23 entries of really excellent quality and good flavour, but there was room for improvement in marketable appearance.

The quality of the cheeses exhibited in the class for Unripened Soft Cheese (other than Cream cheese and made direct from milk)

was, on the whole, very good, but a few cheeses showed signs of gassiness, and the Judge would recommend exhibitors, in future, to pasteurise all milk intended for soft-cheese making.

The produce exhibited in the Class for a Collection of Produce (open to Women's Institutes) was of exceedingly good quality, and some of the exhibitors displayed great skill in the art of packing. It is a pity that more Women's Institutes do not avail themselves of the opportunity of exhibiting produce in this section.

BACON AND HAMS.

The usual Class for Rolled Bacon had been cut out owing to lack of entries.

The entries in the Bacon Classes were numerically about as usual, but the Judges' reports on them differ considerably; while one holds that from the retailers' point of view, the standard of exhibits left much to be desired, another found the winners to be of an exceedingly high character and almost faultless.

A full report on the Classes for Bacon Pigs will be found elsewhere in this Journal, so only a short comment here is called for. It was highly satisfactory to have an increased number of breeds competing which was due to the support of the National Pig Breeders' Association, but according to the Judges' reports, the bacon exhibited in these classes left a good deal to be desired, many of the pigs requiring further feeding, though the time allowed would be quite as long as our competitors take to produce first rate bacon.

The best exhibits in these Classes were, undoubtedly, to be found amongst the first-crosses.

In the Colonial Section, three of the exhibits were overcured and had too much age, but the quality of the remainder was good, though not up to the Danish standard.

The display of Hams in all Classes was excellent.

BUTTER.

The entries in the Two-pound Classes were numerically about the same as last year, except that the Class for Novices was not so well filled.

Quality, generally, was excellent, but a few samples contained too much moisture and one or two had been over-worked and washed. The exhibits made from scalded cream were more uniform.

The entries made in the Commercial Classes were about as usual, and the quality of the exhibits called for no special comment.

The Butter, made up in the most attractive form for table use, was very good, but a few of the exhibits, although well staged, lost on flavour.

Fancy or ornamental design in butter with foliage or other extraneous decoration brought a good class, and the first and second prizes were well deserved.

COLONIAL BUTTER.

The Classes for Colonial Butter, both salted and unsalted, were again well filled; the general quality of the salted butter is reported as below the usual standard, with about two-thirds of the exhibits of a secondary quality, being stale and overworked.

In the Unsalted Class, the quality appears to have been better, with a good first prize-winner, but here again overworking was complained of and many of the butters had lost their freshness, especially on the outsides.

CREAM.

Clotted Cream, in vessels (filled) ready for sale. The exhibits in this Class, with only two or three exceptions, were extremely good, the prize-winning numbers especially being of outstanding merit. One or two lots showed signs of having been over-scalded, while several lots were insufficiently drained.

The Cream, other than clotted, in vessels (filled) ready for sale, showed much greater variations, and while some were on the thin side, many were too thick, so much so that they would not pour out, even when the vessels were held upside down. The exhibit securing the Silver Medal was an ideal sample of Raw Cream in every respect.

BOTTLED FRUITS, VEGETABLES AND JAMS.

The number of entries in these Classes was very disappointing, showing a considerable drop from last year. The exhibits, generally, were not so good as usual and there was nothing of outstanding merit. Some of the would-be exhibitors complained of the entrance fee being too high, but with the prizes offered and the present number of entries, this section of the Show must be run at a heavy loss.

The Fruit Bottling demonstrations were well patronised on Wednesday and Thursday, and much specific information was sought.

HONEY AND WAX.

As was to be expected in a year of sunshine, the entries in these Classes were much more numerous, and the Judge reports that he had never seen such superior light-run honey, perhaps due to the increased growth of wild white clover in the pastures. The medium-coloured honey was also quite up to standard. The dark honey and honey in comb were both good, but not outstanding considering the favourable season.

The Colonial honey was rather difficult to judge as some of the exhibits were granulated and others liquid, so could only be judged chiefly on flavour and consistency.

ROOTS.

The Classes for Roots this year were somewhat restricted and the regulations tightened owing to lack of space, but they were well-filled and the winning lots were outstanding.

While the Mangolds were good, their merits were surpassed by the Swedes; the White Turnips also put up a good show. The winning Cabbages were the best seen for years, and the Collection of Roots contained two exhibits worthy of special mention.

NEW INVENTIONS, &C.

These are reported on elsewhere, their diminution in numbers can be accounted for by a much earlier closing date and by the fact that the Judges now require to test them in practice prior to giving awards.

JUNKET MAKING.

The number of competitors in this popular class was well maintained and the work on the whole was very well done. It would, however, be well for more counties to take an interest in these competitions. Junket making is an excellent way of using milk to advantage, and should be practised everywhere. The junkets sold like hot cakes.

BUTTER MAKING CONTESTS.

The total number of competitors in these contests was only about two-thirds of those in 1927, and, in consequence, only two competitions per day were run. This, though lessening the pressure on the staff, proved to be a mistake as, from the general Show point of view, it is desirable to give the public an interesting spectacle in the evening as well as in the morning and afternoon.

The competitors were largely novices, but the work done was fairly good on the whole. The Championship Contest, which was eventually won by Cornwall, created the usual interest.

MILKERS' CONTESTS.

Here again the number of competitors was only two-thirds of that in 1927, when the competitions were carried out under very cramped conditions. The decrease in numbers was specially noticeable in the class for boys and girls under 18 years, and efforts are needed to remedy this. Now that there are so many milkers' contests held during the year in the various counties and that it is necessary in a practical way to combine cleanly methods with expedition, the Council would do well to appoint a small Committee to lay down more exact rules for the carrying out of these contests.

COW JUDGING CONTESTS.

The usual facilities were found for the "Farmer and Stockbreeder" to hold its contest for the Young Farmers' Clubs. The competition was run by the Ministry of Agriculture; the teams consisted of three members between the ages of 10 and 20 years. The Cup was eventually won by the Buckingham Royal Latin School Calf Club.

The contest open to teams of students at Colleges, Institutes and County Council Classes brought an entry of five, against nine in 1927. This was won by a team from the Cornwall County Council.

THE DAIRY SHOW MILKING TRIALS OF 1928.

By E. W. S. PRESS, B.Sc. (LOND.), A.I.C., F.C.S.

THE Milking Trials during the 1928 Show were carried out on the same general lines as those of 1926, it being of interest to note that it was the second year of the optional twice or thrice milking.

Before passing to further consideration of the latter point it should be remembered that the number of twice milked animals were about half of those of 1926, whilst the thrice milked were double, so with regard to numbers the position was reversed, at least, approximately.

Allocation of Prizes.—The following table gives an idea of the distribution of the prizes between the two sections:—

ALLOCATION OF PRIZES.

No.	CLASS.	ANIMALS MILKED.							
		Twice.				Thrice.			
		No. of Animals in Show	1st.	2nd.	3rd.	No. of Animals in Show	1st.	2nd.	3rd.
1	Dairy Shorthorn Cow (Pedigree)	6	0	0	1	4	1	1	0
2	Dairy Shorthorn Cow (Pedigree, 3-5 years)	11	0	0	1	5	1	1	0
3	Dairy Shorthorn Heifer (Pedigree)	8	0	0	0	4	1	1	1
4	Dairy Shorthorn Cow (Non- Pedigree)	2	1	0	0	0	0	0	0
5	Dairy Shorthorn Heifer (Non- Pedigree)	5	0	1	0	3	1	0	0
6	Lincolnshire Red Shorthorn Cow	0	0	0	0	5	1	1	1
7	Lincolnshire Red Shorthorn Heifer	3	1	0	0	2	0	1	1
8	British Friesian Cow ...	0	0	0	0	11	1	1	1
9	British Friesian Cow 3-5 years	0	0	0	0	6	1	1	1
10	British Friesian Heifer ...	0	0	0	0	9	1	1	1
11	South Devon Cow ...	0	0	0	0	2	1	0	0
13	Dairy South Devon Cow ...	0	0	0	0	5	1	1	1
14	Devon Cow ...	3	0	0	0	0	0	0	0
15	Red Poll Cow ...	2	1	0	0	3	0	1	1
16	Red Poll Cow 3-5 years ...	1	0	0	0	12	1	1	1
17	Red Poll Heifer ...	0	0	0	0	5	1	1	1
18	Blue Albion ...	2	1	0	0	0	0	0	0
19	Blue Albion Heifer ...	1	1	0	0	0	0	0	0
21	Ayrshire Cow ...	1	0	0	0	14	1	1	1
22	Ayrshire Heifer ...	1	0	0	0	9	1	1	1
23	Guernsey Cow ...	0	0	0	0	3	1	1	1
24	Guernsey Cow 3-5 years ...	1	0	0	0	4	1	1	1
25	Guernsey Heifer ...	1	0	0	0	3	1	1	1
26	Jersey Cow ...	7	0	0	1	4	1	1	0
27	Jersey Cow 3-5 years ...	5	0	1	1	4	1	0	0
28	Jersey Heifer ...	11	0	1	1	1	1	0	0
29	Kerry Cow ...	3	1	1	0	1	0	0	1
30	Kerry Heifer ...	1	0	0	0	2	1	1	0
31	Dexter Cow ...	1	1	0	0	2	0	1	1
32	Dexter Heifer ...	1	0	1	0	1	1	0	0
	Totals ...	77	7	5	5	124	22	20	17
			17				59		

When this Table is first examined it would appear that the thrice milkers had an overwhelming success, but this is not the case when an analysis of the figures is made.

It is obvious that before any true comparison can be made all classes in which there was no competition between the two sections should be eliminated; these are classes Nos. 4, 6, 8, 9, 10, 11, 13, 14, 17, 18, 19, 23. When this is done it will be found that 14 prizes were obtained by 67 twice milked, and 34 prizes by 88 thrice milked animals.

Upon reference to the corresponding figures for 1926 the distribution gives 24 prizes amongst 110 animals milked twice, and 29 prizes amongst 70 thrice milked. Now, if 110 animals gain 24 prizes, 67 animals should obtain 15 prizes; whereas for 1928, 67 animals won 14 prizes. Similarly, if 70 animals gained 29 prizes, 88 animals should obtain 36 prizes; whereas for 1928, 88 animals actually obtained 34 prizes. It will be seen from this, that actually, the performances of the sections is very nearly the same in 1926 and 1928 as regards prizes.

With regard to points; reference to Tables II and III will make it clear that, as a general rule, the average of the thrice milkers is greater than the twice milked; but there are various exceptions, and in some cases no comparisons are possible; so the question of compensation for the twice milked remains a *pons asinorum* over which there seems no easy path, but, in any case, two trials would not suffice for any definite step, although it is disappointing that there is no indication of the manner in which the difficulty may be overcome.

Award of Points.—These were made in the same manner as in previous years, the scale being as follows:—

One point for every 10 days since calving, deducting the first 40 days with a maximum of 12 points.

One point for every pound of milk, taking the average of two days' yield.

Twenty points for every pound of butter fat produced.

Four points for every pound of solids, not fat.

Deductions are made of 10 points each time the fat falls below 3 per cent. and 10 points each time the solids, not fat, fall below 8.5 per cent.

Disqualification takes place when at any one milking the composition of the milk falls below 3 per cent. fat and at the same milking below 8.5 per cent. solids, not fat, the animal then being ineligible for any awards or trophies on Inspection, Milking Trials or Butter Tests.

Number of Entries.—The number of entries was considerably less than that of 1926 for, whereas in 1926 there were 420 cows and 27 goats, the numbers in 1928 were 343 cows and 18 goats.

Of the 343 cows entered, one was withdrawn, and the details of the 342 remaining animals will be found in column 3 of Table I. From this it will be seen that 136 animals were entered to be milked twice and 206 to be milked thrice daily.

Number of Competitors.—The total number of animals competing in the Milking Trials were 213; comprising 201 cows (77* + 124†) and 12 goats.

The corresponding figures for the 1926 Show were 233 (136* + 97†) and 13 goats. The details of the entries and the number of animals actually present will be found in Table I.

Number of Breeds Represented.—Twelve distinct breeds were represented at the Show. Class 12 for South Devon Heifers was cancelled, and neither of the two entries in Class 20, Welsh Black Cow, were present.

Highest Points Gained by a Cow.—The highest score of points made by a cow milked thrice daily was 180.1 points gained by a British Friesian Cow, No. 135, whilst an Ayrshire Cow, No. 246, milked twice daily, gained 138.7 points. It is of interest to note neither of these are records.

Highest Yield of Milk.—The highest daily yield on the average of the two days for cows milked thrice daily was 87.9 lbs. given by the British Friesian Cow, No. 135, the milk of this cow was above the presumptive limits for quality at every milking. This animal was closely followed by an Ayrshire Cow, No. 225, which gave 86.5 lbs., but the milk was deficient in fat on one occasion. The highest yield in the case of the twice milked cows was 66.5 lbs., this being given by a Blue Albion Cow, No. 215, there being one deficiency in fat. The yield following this was given by a Red Poll Cow, No. 174, with 64.5 lbs. In this case there were no deficiencies with regard to quality.

The largest yield at one milking was 33.6 lbs. given by the Blue Albion Cow, No. 215*, but it was deficient in fat. It is interesting to recall that the record is still held by a Non-pedigree Dairy Shorthorn, which gave 47.6 lbs. at one milking during the 1921 Trials.

Disqualifications.—As mentioned on page 172, disqualification takes place when the quality of the milk falls both below 3 per cent. fat and 8.5 per cent. solids, not fat, at any one milking.

Of the animals present at the Show, two were disqualified from receiving any award due to deficiency of this character. One was a Pedigree Shorthorn cow and the other a British Friesian cow.

It should be noted that whereas these animals were unable to receive any award, the points they obtained have been included in the calculations of the averages for the respective classes in the Tables.

* Milked twice daily.

† Milked thrice daily.

NOTES ON CLASSES.

Class 1. Pedigree Dairy Shorthorn Cow over 5 years old.—Entries 19 ($12^* + 7^\dagger$), present 10 ($6^* + 4^\dagger$). This class did not contain any outstanding animal, and reference to Table IV shows that cow No. 5, milked twice daily, obtained 123.3 points, whilst the highest total for a cow (No. 15) milked three times daily was 139.3. Three animals failed to attain class standard.

The first prize of the class and the Desborough Cup was won by Mr. Eustace A. Smith's cow, "Longhills Briar" (No. 15 †), with 139.3 points. The second prize and Reserve for the Desborough Cup was awarded to Mr. T. P. Preece's cow, "Dairyman's Girl" (No. 19 †), with 137.2 points.

Class 2. Pedigree Dairy Shorthorn Cow over 3 and under 5 years old.—Entries 28 ($20^* + 8^\dagger$), present 16 ($11^* + 5^\dagger$). The cows milked twice daily averaged a slightly lower number of points than at the 1926 Show, and in the case of the cows milked thrice daily a marked decrease is to be noted. Five animals of the 16 present failed to reach class standard, and one cow was disqualified for falling below standard in both solids, not fat, and fat at one milking.

The first prize of the class was won by Mr. J. S. Taylor's cow, "Whatcote Elegance" (No. 25 †), with 115.0 points, and the second prize was awarded to Major R. F. Fuller's "Chalfield Daffodil 8th" (No. 21 †), with 110.3 points.

The extra prize of £10 offered by the Shorthorn Society in conjunction with the Dairy Shorthorn Association, for the cow exhibited in Classes 1 and 2 gaining most points on Inspection and in the Milking Trials, was awarded to Mr. J. S. Taylor's cow, "Whatcote Elegance" (No. 25 †), Mr. A. R. Fish's "Lowgrove's Spout 4th" (No. 5*), being reserve.

Class 3. Pedigree Dairy Shorthorn Heifer.—Entries 22 ($15^* + 7^\dagger$), present 12 ($8^* + 4^\dagger$). The number of entries as also competitors was half that of 1926. It is to be noted that while the average points of both the twice and thrice milked cows remain about the same, the highest points gained are well below those of the previous Trials. Three of the animals present failed to reach class standard and only one cow lost points for quality. The first prize was awarded to Mr. Eustace A. Smith's "Longhills Barrington Empress 2nd" (No. 65 †), with 90.5 points, and the second prize to Major R. F. Fuller's "Chalfield Jilt 6th" (No. 67 †).

The two extra prizes of £5 each offered by the Shorthorn Society, in conjunction with the Dairy Shorthorn Association, for the two best Heifers exhibited in this class gaining most points on Inspection and in the Milking Trials, were won by Mr. Eustace A. Smith's "Longhills Barrington Empress 2nd" (No. 65 †) and Mr. J. Pierpont Morgan's "Rockley Waterloo Sunset" (No. 57*).

* Milked twice daily. † Milked thrice daily.

Class 4. Non-pedigree Dairy Shorthorn Cow.—Entries 7 ($5^* + 2^\dagger$), present 2*. It will be observed from Table III that the average points were the same as 1926, but one of the animals failed to attain class standard. The first prize and the Dairy Shorthorn Association extra prize of £10 was, therefore, awarded to the remaining animal, Messrs. A. Broome & Sons' cow, "Dossie" (No. 74*).

Class 5. Non-pedigree Dairy Shorthorn Heifer.—Entries 12 ($9^* + 3^\dagger$), present 8 ($5^* + 3^\dagger$). The number of cows present show a good increase on the 1926 Show. Six animals failed to reach the class standard, so that the average for the class is well below the class standard in the case of the twice milked and only just up to standard in the thrice milked cows. It is significant that on reference to Table III it will be noted that the average points for the last ten Shows in the case of the twice milkers is only 73.6, this being the same figure as that of the thrice milkers for the last two Trials.

The first prize was won by Messrs. Kidner Bros' cow, "Stokelycross Frolic 4th" (No. 89†), with 93.2 points, and the second prize by Mr. T. Morley's cow, "Rose" (No. 78†), with 78.8 points.

Class 6. Lincolnshire Red Shorthorn Cow.—Entries 7†, present 5†. The number present in this class remains low, although Mr. Sydney Reading's cow, "Langford Damsel 21st" (No. 96†), made a record score for this class with 163.3 points, thus winning first prize, the second prize being secured by Messrs. John Evens & Sons' cow, "Burton Red Rose 6th" (No. 95†), with 149.7 points.

Class 7. Lincoln Red Shorthorn Heifer. Entries 10 ($3^* + 7^\dagger$), present 5 ($3^* + 2^\dagger$). The number present compare favourably with 1926, and it must be noted that all the competitors were well above the class standard. The average points for the twice milked cows were the highest for the last ten years and the average for the thrice milked was higher than 1926.

The first prize was awarded to Mr. Sydney Reading's "Langford Heaven 12th" (No. 106*), with 109.7 points, this being the record score for this class, the points being gained by superiority both in quantity and quality of milk. The second prize was awarded to Messrs. John Evens & Sons' "Burton Hempy 12th" (No. 103†), with 95.7 points.

Class 8. British Friesian Cow over 5 years old.—Entries 28†, present 11†. The average number of points showed a diminution from 149.4 to 125.6 for the cows milked thrice daily, and the highest points are well below the record for 1926. Four animals failed to attain the standard of the class, and one of these was disqualified for the poor quality of its milk at one milking, seven lost points for fat, and two for solids, not fat. The first prize was awarded to Lord Rayleigh's cow, "Terling Unique" (No. 120†), with 163.7 points, the second being

* Milked twice daily.

† Milked thrice daily.

won by Miss E. Martin Smith's cow, "Sudbourne Flossiewijk" (No. 114†), with 149.3 points. The Morrison Challenge Trophy was awarded to Mr. Clifford W. H. Glossop's cow, "Lund (imp. 1922) Blanche 22nd."

Class 9. British Friesian Cow over 3 and under 5 years old.—Entries 11 (1* + 10†), present 6†. The standard of this class was good on the whole, one animal losing points for quality of fat and one cow failed to attain class standard. The first prize, the Barham Challenge Cup and Shirley Challenge Cup was awarded to Mr. Hubert M. Martineau's "Holyport Unity" (No. 135†), with 180.1 points, this being a record score. The second prize was won by Mr. Thomas Brown's "Haslington Frisky" (No. 140†), with 161.7 points.

Class 10. British Friesian Heifer.—Entries 15 (1* + 14†), present 9†. The general standard of this class is not quite so good as 1926 the average points being lower and the deficiencies in quality being greater. Two animals did not reach class standard. The first prize was won by Mr. A. Weightman's "Herrington Flora" (No. 156†), with 115.0 points, closely followed by Capt. John Christie's "Glyndebourne Skylark" (No. 149†), with 114.6 points, thus gaining second prize.

Class 11. South Devon Cow entered in or eligible for the Herd Book of the South Devon Herd Book Society.—Entered 3†, present 2†. Of the two animals present one failed to reach class standard, the first prize and South Devon Silver Challenge Cup being won, therefore, by Mr. George Will's cow, "Milkmaid 14th" (No. 161†), with 158.6 points, this being a very good score.

Class 13. Dairy South Devon Cow entered in or eligible for the Herd Book of the Recorded Dairy South Devon Cattle Society.—Entered 7†, present 5†. Only one animal failed to attain class standard. The first prize, Dairy South Devon Cup, Spencer Challenge Cup and reserve for the British Dairy Farmers' Association Supreme Individual Challenge Trophy were awarded to the Seale-Hayne Agricultural College's cow, "Foreman 3rd" (No. 164†), with the excellent score of 160.9 points. The second prize and reserve for the Dairy South Devon Cup was gained by Mr. Peter Cock's "Alice 50th" (No. 170†), with 145.6 points.

Class 14. Devon Cow.—Entries 3*, present 3*. Owing to the fact that none of these animals attained class standard no award could be made.

Class 15. Red Poll Cow over 5 years old.—Entries 13 (5* + 8†), present 5 (2* + 3†). This class does not call for any remarks. Two animals failed to attain class standard. The first prize was awarded to Mr. N. A. Heywood's cow "Brettenham Bertha" (No. 174*), with 131.1 points, the second prize going to Messrs. C. F. Newton & Sons' "Saham Darker Drought" (No. 181†), gaining 126.9 points.

* Milked twice daily.

† Milked thrice daily.

Class 16. Red Poll Cow over 3 and under 5 years old.—Entries 17 (3* + 14†), present 13 (1* + 12†). Only one animal fell below class standard the remainder being well above.

The first prize was won by Sir Merrik R. Burrell's 'Knepp Beryl 3rd' (No. 188†) gaining the high score of 154.7 points. Viscount Folkestone's "Longford Pierotte" (No. 191†) secured second prize with 144.8 points.

Class 17. Red Poll Heifer.—Entries 11 (1* + 10†), present 5†. The points for this class were up to the average and only one animal failed to reach class standard. The first prize and second prize were awarded to Major J. A. Morrison's "Basildon Rosalind 3rd" (No. 211†), with 124.8 points, and "Basildon Royal Rosie 5th" (No. 213†), with 110.2 points, respectively.

Class 18. Blue Albion Cow.—Entries 5*, present 2*. This class was poor this year for one of the two animals present failed to reach class standard so only the first prize was awarded, this being won by Mr. R. H. A. Holbech's cow, "Seagry Alice" (No. 215*), with 125.9 points.

Class 19. Blue Albion Heifer.—Entries 2*, present 1*. Unfortunately the number in this class has not increased, although it is true that this is only the second occasion that this class has competed. The only animal present was above standard, thus securing first prize, this being "Blue Bell 2nd" (No. 220*), owned by Mr. J. W. Towler.

Class 21. Ayrshire Cow.—Entries 23 (1* + 22†), present 15 (1* + 14†). This year the class standard was raised to 100 from 90, and in spite of this the usual excellent performance of this breed was maintained, every animal being well above this figure.

The first prize was awarded to Mr. John N. Drummond's cow, "Bargower Eva" (No. 244*), with 176.3 points. This animal also won the British Dairy Farmers' Association Supreme Individual Challenge Trophy and the Rowallan Champion Cup and was reserve for the Spencer Cup and Barham Challenge Cup. It should be noted that the score of this animal is a record for the breed by two points. The second was awarded to Messrs. Jones & Watson's cow, "Harleyholm Jenny 3rd" (No. 225†), with 165.9 points, which was also reserve for the Rowallan Champion Cup and Shirley Challenge Cup.

Class 22. Ayrshire Heifer.—Entries 15 (1* + 14†), present 10 (1* + 9†). In accordance with the raised class standard of Class 21 the standard for this class is now 66 instead of 60. There was only one animal which failed to attain class standard. The first prize-winner was Mr. A. W. Montmerre's "Linnhead Cora Linn 2nd" (No. 258†) with 122.5 points, and the second prize was awarded to Messrs. R. Sillars & Son's "Ickham Lucy" (No. 257†), with 118.1 points.

* Milked twice daily.

† Milked thrice daily.

Class 23. Guernsey Cow.—Entries 4†, present 3†. The number in this class was disappointing. The first prize and Stagenhoe Challenge Cup was won by Lord Remnant's "Southern Starrette" (No. 265†), with 126.9 points, the second prize being awarded to Messrs. Hargreaves' "Hadham Golden Cloud 8th (No. 263†), with 111.5 points.

Class 24. Guernsey Cow over 3 and under 5 years old.—Entries 7 (1* + 6†), present 5 (1* + 4†). The number present was the same as 1926, and all exceeded class standard. The first prize was awarded to Mr. A. Chester Beatty's "Calehill Dewdrop" (No. 266†), with 114.7 points, this animal also being reserve for the Stagenhoe Challenge Cup. The second prize was won by Capt. H. J. Pilbrow's "Bosistow Nemesis" (No. 270†), with 110.8 points.

Class 25. Guernsey Heifer.—Entries 4 (1* + 3†), present 4 (1* + 3†). This year shows a regrettable diminution in this class, although the standard was much better than 1926, for no animal failed to reach class standard. The first prize was awarded to Capt. J. E. Monins' "Ringwold Graceful" (No. 276†), with 89.9 points, and the second prize to Mr. R. Pearce Gould's "Nelly's Pride of the Blanche" (No. 274†), with 71.7 points.

Class 26. Jersey Cow.—Entries 17 (13* + 4†), present 11 (7* + 4†). Only one animal failed to reach class standard. On reference to Tables III and IV it will be noted that the average for the twice milkers is the highest for ten years and a record in the highest points gained was made by a thrice milked cow, this being achieved by Mr. H. Cecil Pelly's cow, "Sixty Five" (No. 278†), with 139.0 points, thus winning first prize, and also the National Milk Cup. The second prize and reserve for the National Milk Cup was awarded to Mr. Cortlandt Taylor's cow, "Demure Princess" (No. 280†), with 120.0 points.

Class 27. Jersey Cow over 3 and under 5 years old.—Entries 12 (6* + 6†), present 9 (5* + 4†). Only one animal failed to reach class standard. The first prize was awarded to Capt. F. B. Imbert-Terry's "Blue Hayes Noble Star" (No. 300†), with 122.6 points, and the second prize was awarded to Mr. Grosvenor Berry's "Red Negundo" (No. 297*), with 109.1 points.

Class 28. Jersey Heifer.—Entries 20 (17* + 3†), present 12 (11* + 1†). The number present were the same as 1926, and also their disposition as regards milking. Three animals failed to attain the requisite 60 points of Class standard. The first prize was gained by Sir Harold Mackintosh's "Culverden Consus Maid" (No. 306†), with 97.2 points, and the second by the Earl of Strafford's "Wrotham Opal 2nd" (No. 317*), with 95.3 points.

Class 29. Kerry Cow.—Entries 9 (7* + 2†), present 4 (3* + 1†). Although the entries were better the number of animals present did not show any marked improvement. The average for the class was

* Milked twice daily.

† Milked thrice daily.

considerably less than 1926, and one animal fell below class standard. The first prize and Kerry Cup was won by Mr. J. W. Towler's "Wadlands Sweet Clover" (No. 328*), with 98.5 points, the second prize and reserve for the Kerry Cup going to "Rosebud of Carton" (No. 330*), with 81.7 points, also owned by Mr. J. W. Towler.

Class 30. Kerry Heifer.—Entries 3 (1* + 2†), present 3 (1* + 2†). One animal fell below class standard, so the first and the second prizes were awarded to Capt. Nelson Zambra's "Hattingley Ellen" (No. 335†), with 71.1 points, and "Hattingley Ellengrane" (No. 336†), with 66.1 points, respectively.

Class 31. Dexter Cow.—Entries 3 (1* + 2†), present 3 (1* + 2†). A record for this class was created by the first prize-winner, Lady Loder's "Grinstead Taxus" (No. 338*), with 105.9 points, this being the highest number of points gained by any cow of this class for the last ten years, this animal being a twice milked cow. This cow also won the Nutt Challenge Cup. Mrs. H. P. May's "Braxted Winkie" (No. 340†) gained second prize, and reserve for the Nutt Challenge Cup with 84.9 points.

Class 32. Dexter Heifer.—Entries 3 (2* + 1†), present 2 (1* + 1†). Both animals present were above standard so each gained a prize. The first prize was won by Mr. G. Noel Hunter's "Hookstyle Just Found 2nd" (No. 341†), with 60.6 points, and the second prize went to Lady Loder's "Grinstead Nightingale 3rd" (No. 343*), with 60.3 points.

The following classes are for the progeny of bulls and the awards are made on the basis of progeny performance. This is the first year these classes have been established, taking the place of the exhibition of bulls which is no longer allowed, the aim being to recognise the value and encourage the breeding of bulls with a view to the higher milk efficiency of their progeny.

Competitors must exhibit in the ordinary breed classes (1-32) two animals of their own breeding and the progeny of one particular bull.

The awards are made on the number of points gained above the breed standard for the class in the Milking Trials, it being necessary for each animal to attain its respective class standard, and no exhibitor may make more than two entries in one Bull Class.

A medal is awarded to the breeder of each bull whose progeny receives a first prize.

Class 33. Dairy Shorthorn Bull (Progeny of).—Entries 7, present 3. The first prize was won by Mr. R. Tustian's "Greattew Sophia" and "Greattew Sophie" (Nos. 42 and 43), being the progeny of the

* Milked twice daily.

† Milked thrice daily.

bull "Greattew Lord," also bred by Mr. R. Tustian. No other prize was awarded as the other two competitors failed to attain class standard, with one cow of each pair in both cases.

Class 34. Lincolnshire Red Shorthorn Bull (Progeny of).—Entries 4, present 2. The first prize goes to Mr. Sydney Reading's "Langford Damsel 34th" and "Langford Heavens 12th" (Nos. 105 and 106), being the progeny of the bull "Langford Jolly 2nd," bred by Mr. Sydney Reading. The second prize was awarded to Messrs. John Evens & Sons' cows, "Burton Young Cherry 9th" and "Burton Rosemary 20th" (Nos. 92 and 100), the progeny of the bull "Burton Royal Son," bred by Messrs. John Evens & Sons.

Class 35. British Friesian Bull (Progeny of).—Entries 4, present 2. The first prize was won by Mr. A. Weightman's "Herrington Flora" and "Herrington Gladys" (Nos. 156 and 157), being the progeny of the bull "Brookland Ynte," bred by Mr. C. Wordsworth. Second prize was awarded to Capt. J. Christie's "Glyndebourne Skylark" and "Glyndebourne Elva 3rd" (Nos. 149 and 150), progeny of "Glyndebourne (imp. 1922) Rikus," bred by the Golden Valley Citrus Estates, Ltd.

Class 36. Red Poll Bull (Progeny of).—Entry 1, present nil.

Class 37. Ayrshire Bull (Progeny of).—Entries 3, present 2. First prize awarded to Mr. O. D. Maxted's "Garrington Rosie 3rd" and "Garrington Violet 1st" (Nos. 248 and 249) the progeny of the bull "Ickham Souvenir," bred by Messrs. R. Sillars & Son. Second prize was awarded to Mr. John Cochrane's "Byreholm Grace" and "Byreholm Gay Lass 2nd" (Nos. 253 and 254), the progeny of the bull "Barr Garrylinn," bred by Messrs. A. & A. Kirkpatrick.

Class 38. Guernsey Bull (Progeny of).—Entries 2, present 1. The first and only prize in this class was awarded to the Messrs. Hargreaves' "Hadham Golden Cloud 8th" and "Nazeing Marigold 3rd" (Nos. 263 and 268), progeny of the bull "Downe Star of Honeymoon," bred by Mr. D. C. Haldeman.

Class 39. Jersey Bull (Progeny of).—Entry 1, present 1. The first and only prize was awarded to Mr. Grosvenor Berry's "Postgirl 2nd" and "Nimrod's Primrose" (Nos. 295 and 296), the progeny of the bull "Nimrod," bred also by Mr. Grosvenor Berry.

Class 40. Bull of Any Other Dairy Breed (Progeny of).—Entry 1, present 1. There was no award in this class as one of the two animals present failed to attain class standard.

CHALLENGE CUPS AND TROPHIES.

Open to all Breeds.

The British Dairy Farmers' Association's Supreme Individual Championship Challenge Trophy.—This trophy, which is open for individual competition, is the blue riband of the Show. It is awarded to the owner of the cow gaining the greatest number of points on Inspection (first prize 50 points, second prize 45 points, third prize 40 points, reserve 35 points) in the Milking Trials (provided the quality of the milk does not fall below 3 per cent. fat or 8·5 per cent. solids, not fat, at any milking, and twice the number of points in the Butter Test, taking lactation points once only.

The Gold Medal of the Association is presented to each year's winner of this trophy.

The following table gives details of the points awarded, from which it will be seen that the Ayrshire cow, "Bargower Eva" (No. 244†), owned by Mr. John N. Drummond, secured this supreme award.

The reserve was the Seale-Hayne Agricultural Colleges' Dairy South Devon cow, "Foreman 3rd" (No. 164†).

Cow No.	244†	164†	120†
Inspection Points	45·0	45·0	45·0
Milking Trial Points	176·3	160·9	163·7
Butter Test Points × 2	112·0	121·5	116·5
Total	333·3	327·4	325·2
Award	Winner.	Reserve.	—

The Bledisloe Challenge Trophy.—Owing to the fact that this is awarded to the breed society adjudged to have the best exhibit of good all round dairy cows, it is easy to understand that after the Supreme Individual Award this is the trophy which creates the keenest competition and interest. This competition is conducted upon lines which may be changed from time to time by the Council of the Association, but at the 1928 Show the conditions were essentially the same as those of the 1926 Show. The animals to compete on behalf of each breed were the six cows in the senior classes with the highest points in the Milking Trials, provided each animal has been considered typical of its breed by the Inspection Judges, and has attained the breed class standard points in the Milking Trials.

The total number of points gained by each team of six cows consists of the sum of the Milking Trial points of each animal, plus Inspection points (100 points first prize, 90 points second, 80 points third, and 70 fourth).

* Milked twice daily.

† Milked thrice daily.

Only three breeds provided teams of six animals, and the details are given in the following table.

THE BLEDISLOE TROPHY TEAMS AND POINTS GAINED.

Class 21—Ayrshires.				Class 8—British Friesians.			
No. in Catalogue.	Milking Trial Points.	Inspection Points.	Total Points.	No. in Catalogue.	Milking Trial Points.	Inspection Points.	Total Points.
244†	176.3	90	226.3	120†	163.7	90	253.7
225†	165.9	100	265.9	114†	149.3	100	249.3
239†	153.0	80	233.0	132†	148.2	80	228.2
233†	152.3	70	222.3	123†	135.2	—	135.2
245†	144.3	—	144.3	122†	129.2	—	129.2
243†	140.7	—	140.7	109†	128.0	—	128.0
	932.5	340	1272.5		853.6	270	1123.6

The following is a summary of the points gained in the competition for the Bledisloe Trophy, with the breeds arranged in order of merit.

Class 26—Jerseys.				Class 1—Pedigree Shorthorns.			
278†	139.0	100	239.0	15†	139.3	—	139.3
280†	120.0	—	120.0	19†	137.2	—	137.2
293*	113.2	—	113.2	5*	123.3	100	223.3
277†	113.1	70	183.1	20†	117.8	—	117.8
292*	109.5	—	109.5	14†	117.1	—	117.1
286*	105.9	—	105.9	3†	113.4	—	113.4
	700.7	170	870.7		748.1	100	848.1

Class.	Breed.	Milking Trial Points.	Inspection Points.	Total.	Remarks.
21	Ayrshire	932.5	340	1272.5	Winner.
8	British Friesian	853.6	270	1123.6	Reserve.
26	Jersey	700.7	170	870.7	—
1	Pedigree Shorthorn	748.1	100	848.1	—

The Ayrshire Cattle Herd Book Society hold the Trophy for the year, with the British Friesian Cattle Society as reserve.

The Morrison Challenge Trophy is awarded to the owner of the cow exhibited at three consecutive London Dairy Shows gaining the greatest number of points totalled as follows: (a) Number of points in the Milking Trials above standard for the class, plus (b) three times the number of points in the Butter Test above the standard for the breed, and (c) Inspection points as follows:—first prize 40 points, second prize 30 points, third prize 20 points, fourth and reserve 10 points.

* Milked twice daily.

† Milked thrice daily.

The winner was Mr. Clifford W. H. Glossop's British Friesian cow, "Lund (imp. 1922) Blanche 22nd" (No. 109†), with a total of 222.2 points. This cow's record at the Shows of 1925 and 1926, together with her points for this year, are given below in detail.

Year.	No. in Catalogue.	Milking Trials.			Butter Tests.			Inspection.	
		Points.	Standard	Net Points.	Points.	Standard	Net Points.	Award.	Points.
1925	159	137.0	91.6	45.4	37.5	30	22.5	2nd.	30
1926	172	154.1	110.0	44.1	46.2	34	25.8	2nd.	30
1928	109	126.7	110.0	17.7	36.2	34	6.7	H.C.	—
		Totals ...							60
		GRAND TOTAL ...			222.2 points.				

The *Barham Challenge Cup* is awarded to the owner of the cow gaining the greatest number of points in the Milking Trials.

The British Friesian cow (No. 135†), "Holyport Unity," was the winner, being the property of Mr. Hubert M. Martineau. Mr. J. N. Drummond's "Bargower Eva" (No. 244†), was reserve.

The *Spencer Challenge Cup* is awarded to the owner of the cow gaining the greatest number of points by Inspection, Milking Trial and Butter Tests.

The Inspection points are as follows :—50 for first, 45 for second, 40 for third, 35 for reserve or very highly commended, 30 for highly commended and 25 for commended.

This year the Cup was won by the Dairy South Devon cow, "Foreman 3rd" (No. 164†), owned by the Seale-Hayne Agricultural College, the reserve being Mr. J. N. Drummond's Ayrshire cow, "Bargower Eva" (No. 244†).

The *Shirley Challenge Cup* is awarded to the owner of the cow giving the greatest weight of milk in the Milking Trials, such milk to contain not less than 3 per cent. fat and 8.5 per cent. non-fatty solids, and was won by the British Friesian cow, "Holyport Unity" (No. 135†), owned by Mr. H. M. Martineau, the reserve being Messrs. Jones & Watson's Ayrshire cow, "Harleyholm Jenny 3rd" (No. 225†).

The *National Milk Cup*, awarded to the owner of the cow or heifer entered in or eligible for the Herd Book of its breed gaining the greatest number of points per 1,000 lbs. live weight in the Milking Trials, was awarded to Mr. H. Cecil Pelly's Jersey cow, "Sixty Five" (No. 278†), with 148.4 points per 1,000 lbs. live weight, the reserve being Mr. Cortlandt Taylor's Jersey cow, "Demure Princess" (No. 280†), with 144.4 points per 1,000 lbs. live weight.

* Milked twice daily.

† Milked thrice daily.

The Robert L. Mond Special Prize of £10 is awarded to the owner of the two animals competing in the Milking Trials, which are the progeny of a registered bull of the same breed, and which gain the largest number of points above their class standard and are certified as true to type by the class Inspection Judge.

There were twelve entries. The winner was Mr. O. D. Maxted's two Ayrshire Heifers, the progeny of the bull, "Ickham Souvenir" (23465).

The second prize of £5, donated by the Countess de la Warr, was won by Mr. John Cochrane with two Ayrshire Heifers the progeny of the bull, "Barr Garrylinn" (24254). The reserve was Mr. A. Weightman with two British Friesian Heifers the progeny of the bull, "Brooklands Ynte" (11145).

The points gained by the leading competitors are given below:—

Catalogue No.	Milking Trial Points.	Class Standard.	Balance.	Total.
<i>Progeny of Ickham Souvenir (23465) (Ayrshire).</i>				
248†	109.8	66.7	43.1	} 70.7
249†	94.3	66.7	27.6	
<i>Progeny of Barr Garrylinn (24254) (Ayrshire).</i>				
253†	98.7	66.7	22.0	} 64.0
254†	98.7	66.7	22.0	
<i>Progeny of Brooklands Ynte (11145) (British Friesian).</i>				
156†	115.0	73.3	41.7	} 63.6
157†	95.2	73.3	21.9	

In view of the keen competition between the various breeds at the Dairy Show it is interesting to note the distribution of the Cups and Trophies. The following tabulation gives both the winner and reserve in each case:—

	Breed of Winner.		Breed of Reserve.	
Supreme Champion Trophy	Ayrshire	...	South Devon.	
Bledisloe Trophy	...	Ayrshire	...	British Friesian.
Morrison Trophy	...	British Friesian	...	—
Barham Cup	...	British Friesian	...	Ayrshire.
Spencer Cup	...	South Devon	...	Ayrshire.
Shirley Cup	...	British Friesian	...	Ayrshire.
National Milk Cup	...	Jersey	...	Jersey.
R. L. Mond Prize	...	Ayrshire	...	—
Countess de la Warr	...	Ayrshire	...	British Friesian.

* Milked twice daily.

† Milked thrice daily.

TABLE I.

Class.	Description.	Number in Class.		Average Live Weight of Class.	Average Yield of Milk.	Yield of Milk per 1,000 lbs. Live Weight.	Average Fat.	Animals below Standard for Fat. A.M. or P.M.	Animals losing Points for Quality of Milk.	Average Points lost by Class for Quality of Milk.	Points per 1,000 lbs. Live Weight.	Average Points gained by Class.	B.D.F.A. Standard Points for Class.
		Entered.	Present in Milking Trials.										
	<i>Cows over 5 years old.</i>			lbs.	lbs.	lbs.	%	%	%				
1	Dairy Shorthorn ...	12*	6	1,335	50.0	37.4	3.49	16.6	16.6	1.66	76.4	101.4	100
4	" Non-Pedigree	7†	4	1,442	60.9	42.2	3.62	25.0	25.0	2.50	80.2	127.6	100
6	" Lincoln Red Shorthorn ...	5*	2	1,344	48.9	36.4	4.01	0	0	0	80.5	106.8	110
8	Lincoln Red Shorthorn ...	2†	0	—	—	—	—	—	—	—	—	—	—
11	British Friesian ...	7†	5	1,329	61.5	46.3	3.79	20.0	20.0	2.00	97.7	123.8	100
13	British Friesian ...	28†	11	1,516	65.0	42.9	3.27	63.6	6.36	10.9	85.2	125.6	110
15	South Devon (Herd Book Society)...	3†	2	1,652	58.3	35.3	3.91	0	0	0	77.7	137.4	100
18	" (Recorded Cattle Society)	7†	5	1,427	49.9	35.0	4.05	0	0	0	83.3	123.5	100
20	Devon ...	3*	3	1,414	20.9	14.8	4.50	0	33.3	3.33	44.8	56.0	90
21	Red Poll ...	5*	2	1,221	51.5	42.2	3.37	0	0	0	82.3	107.5	100
23	Blue Albion ...	8†	3	1,343	51.2	38.1	4.06	66.6	66.6	6.66	83.0	109.7	100
26	Welsh Black ...	5*	2	1,236	49.7	40.4	2.85	100.0	100.0	15.0	66.4	84.6	100
29	Welsh Black ...	2†	0	—	—	—	—	—	—	—	—	—	90
31	Ayrshire ...	1*	1	1,220	60.0	49.2	4.75	0	0	0	113.6	138.7	100
	Guernsey ...	22†	14	1,251	64.0	51.1	4.04	14.3	14.3	1.43	111.0	138.4	100
	Jersey ...	4†	3	1,116	47.6	42.7	4.41	0	0	0	101.1	111.2	85
	Kerry ...	13*	7	959	39.6	41.3	5.24	0	0	0	108.5	103.9	90
	Dexter... ..	7†	4	866	45.0	52.0	5.00	0	0	0	130.2	114.3	90
	Carried forward	7*	3	950	36.2	38.2	4.98	0	0	0	80.8	84.6	80
		2†	1	878	42.7	48.0	3.22	100.0	100.0	10.0	91.3	80.8	80
		1*	1	756	47.2	62.3	4.11	0	0	0	139.5	105.8	70
		2†	2	847	36.0	42.6	3.80	0	0	0	107.7	83.8	70
		53*	27										
		98†	54										

* Milked twice daily.

† Milked thrice daily.

TABLE I.—Continued.

Class.	DESCRIPTION.	Number in Class.		Average Live Weight of Class.	Average Yield of Milk.	Yield of Milk per Ave. Weight.	Average Fat.	Animals Below Standard for Fat, A.M. or P.M.	Animals Testing Points for Quality of Milk.	Average Points lost by Class for Quality of Milk.	Points per Ave. Weight.	Average Points gained by Class.	B.D.F.A. Standard Points for Class.
		Entered.	Present in Milking Trials.										
2	Brought forward Cons over 3 and under 5 years old. Dairy Shorthorn	53* 98†	27 54	lbs.	lbs.	lbs.	%	%	%				
		20*	11	1,243	46.5	37.3	3.60	36.6	45.4	5.5	74.5	90.6	89
		8†	5	1,187	48.5	40.8	3.57	40.0	40.0	6.0	80.1	95.1	85
		1*	0	1,338	65.3	46.7	3.53	16.6	16.6	1.6	96.5	133.4	91
		10†	6	1,232	55.6	47.8	4.45	0	16.6	0	97.8	120.5	83
9	British Friesian	14†	12	1,257	52.6	47.7	4.32	8.3	16.6	1.6	99.3	122.8	83
		1*	1	1,017	39.9	39.3	4.37	25.0	25.0	2.5	98.4	99.9	71
24	Guernsey	6*	4	1,012	44.2	43.6	4.57	0	0	0	118.8	101.3	75
		6*	5	855	36.9	43.3	5.72	0	0	0	93.2	93.5	75
27	Jersey	0†	4	1,002	36.6	36.5	5.27	0	0	0	64.2	67.8	66
		15*	8	1,072	31.6	29.5	4.04	12.5	12.5	1.25	60.9	75.3	66
3	Dairy Shorthorn	7†	4	1,082	34.5	31.9	4.00	0	25.0	5.0	56.7	63.0	73
		9*	5	1,120	27.8	25.1	4.37	0	66.6	16.6	64.3	73.0	73
5	" Non-Pedigree	3†	3	1,147	43.6	38.0	2.92	0	0	0	73.2	89.2	66
		3*	2	1,159	37.9	32.7	4.81	0	0	0	71.7	95.7	66
7	Lincoln Red Shorthorn	7†	2	1,338	43.8	32.8	4.21	0	0	0	68.7	88.0	73
		1*	0	1,281	45.9	35.8	3.36	33.3	44.4	6.6	83.1	74.4	66
10	British Friesian	14†	9	1,281	45.9	35.8	3.36	33.3	44.4	6.6	83.1	74.4	66
		10†	5	1,145	41.6	36.3	4.31	0	0	0	75.3	78.1	66
17	Red Poll	10†	5	1,026	26.5	25.9	3.87	0	0	0	96.2	103.1	66
		1*	1	1,107	27.9	25.4	4.10	0	11.1	2.2	67.2	69.1	56
19	Blue Albion	14†	9	1,079	49.7	46.1	3.81	11.1	0	0	92.5	77.4	56
		1*	1	1,028	32.3	31.4	3.90	0	0	0	95.0	97.2	60
22	Ayrshire	3†	3	836	33.1	39.6	4.08	0	0	0	135.3	74.7	60
		17*	11	763	28.2	37.0	5.09	0	0	0	88.9	68.6	53
25	Guernsey	3†	3	1,012	43.2	33.3	4.21	0	0	0	102.2	60.3	46
		1*	1	718	43.2	33.3	3.55	0	0	0	99.3	60.6	46
28	Jersey	2†	2	691	32.5	42.3	4.92	0	0	0	102.2	60.3	46
		2†	2	770	32.5	42.3	4.92	0	0	0	102.2	60.3	46
30	Kerry	2†	2	578	24.2	48.2	3.37	0	0	0	102.2	60.3	46
		2†	2	607	29.2	48.2	3.37	0	0	0	102.2	60.3	46
32	Dexter	1†	1	607	29.2	48.2	3.37	0	0	0	102.2	60.3	46
		1†	1	607	29.2	48.2	3.37	0	0	0	102.2	60.3	46
32	TOTAL	186*	77										
		206†	124										
32	TOTAL	342	201										
		342	201										

* Milked twice daily.

† Milked thrice daily.

TABLE II.—SHOWING NUMBER OF COWS TESTED, AVERAGE POINTS GAINED AND THE NUMBER OF COWS ATTAINING THE SOCIETY'S STANDARD—1925 TO 1928.

Class.	Description.	B.D.F.A. Standard Points.	Number of Cows Tested.			Average Points Gained.			Number and Percentage of Cows above Standard.			Average Live Weight of Class.		
			1925	1926	1928	1925	1926	1928	1925	1926	1928	1925	1926	1928
1	Dairy Shorthorn—Pedigree	100	12*	8*	6*	108.2	113.3	101.4	7	58.3	3	50.0	11	92.13
2	Ditto (over 3 and under 5 years)	100	10*	24	4*	92.8	120.3	127.6	6	60.0	4	100.0	—	11
3	Ditto Heifers	83	13*	11*	11*	73.3	88.3	90.6	8	61.5	7	75.0	10	84.9
4	Dairy Shorthorn—Non-Pedigree	100	6*	6*	2*	121.7	106.0	106.8	5	83.3	1	50.0	12	131.1
5	Ditto Heifers	73	3*	1*	5*	73.3	56.3	63.0	2	66.6	0	0.0	—	12
6	Lincoln Red Shorthorn	100	11*	9*	3*	115.4	121.1	123.8	8	72.7	1	20.0	10	141.0
7	Ditto Heifers	66	5*	3*	5*	84.6	87.7	89.9	5	100.0	5	100.0	10	48.10
8	British Friesian	110	14*	16*	11*	123.8	120.6	125.6	9	64.3	7	63.6	12	49.11
9	Ditto (over 3 and under 5 years)	91	5*	1*	6*	119.8	107.1	108.4	6	85.7	—	83.3	13	13.12
10	Ditto Heifers	73	3*	4*	9*	87.9	80.9	88.0	2	66.6	5	88.8	11	105.12
11	South Devon (Herd Book Soc.)	100	2*	8*	9*	114.9	94.6	98.0	1	50.0	8	88.8	14	53.13
13	South Devon (Rec. Cattle Soc.)	100	6*	1*	2*	103.6	165.9	127.4	4	66.6	1	50.0	13	110.14
14	Devon	90	8*	—	5*	103.2	113.2	123.5	5	62.5	0	0	11	82.11
15	Red Poll	100	6*	6*	3*	125.4	116.5	107.5	5	83.3	1	50.0	11	83.10
16	Ditto (over 3 and under 5 years)	83	4*	3*	1*	97.7	90.1	120.5	3	75.0	2	66.6	11	17.11
			12*	3*	12*	106.0	122.6	122.6	3	100.0	11	91.6	10	62.10

* Milked twice daily.

† Milked three daily.

TABLE II.—SHOWING NUMBER OF COWS TESTED, AVERAGE POINTS GAINED AND THE NUMBER OF COWS ATTAINING THE SOCIETY'S STANDARD—1925 TO 1928.—Continued.

Class.	Description.	B.D.F.A. Standard.	Number of Cows Tested.		Average Points Gained.		Number and Percentage of Cows above Standard.				Average Live Weight of Class.	
			1925	1926	1928	1925	1926	1928	%	%	1925	1928
17	Red Poll Heifers	66	5*	3*	—	86.0	77.2	—	4	80.0	10	30
18	Blue Albion ..	66	—	5†	2*	—	83.5	74.6	—	80.0	—	9
19	Ditto Heifers	100	5*	5†	1*	128.3	120.1	84.6	5	100.0	10	57
20	Welsh Black	90	2*	3*	—	—	87.8	78.1	4	50.0	12	73
21	Ayrshire ..	90	—	1†	—	104.1	94.0	—	2	100.0	—	11
22	Ditto Heifers	90	16*	—	1*	121.7	87.8	—	1	100.0	10	42
23	Guernsey ..	85	15*	14†	1*	90.4	137.1	138.7	13	81.3	10	96
24	Ditto (over 3 and under 5 years)	85	8*	13†	9†	77.5	101.3	104.1	14	100.0	9	100
25	Ditto Heifers	71	9*	4*	1*	76.6	89.5	93.8	12	100.0	9	100
26	Jersey ..	90	12*	12*	3†	68.8	64.8	69.1	2	25.0	9	55
27	Ditto (over 3 and under 5 years)	75	11*	1†	4†	95.3	98.6	103.9	7	77.7	8	12
28	Ditto Heifers	60	10*	1†	1†	92.5	97.7	101.3	3	75.0	7	55
29	Kerry ..	80	7*	3*	3*	68.7	60.5	73.1	8	100.0	8	45
30	Ditto Heifers	53	3*	4*	1†	105.6	112.3	84.6	9	75.0	10	63
31	Dexter ..	70	3*	2*	2†	69.0	64.5	51.8	11	100.0	7	94
32	Ditto Heifers	46	1*	1†	1†	78.8	62.6	105.8	5	50.0	6	58
						53.8	88.7	60.3	7	100.0	8	50
								60.6	3	100.0	6	65
									2	100.0	7	58
									2	100.0	6	84
									1	100.0	4	96
									1	100.0	—	—

* Milked twice daily.

† Milked thrice daily.

§ B.D.F.A. Standard Points—1928—Ayrshire, 100; Ayrshire Heifers, 66.

TABLE V.—QUANTITY AND QUALITY OF MILK. 1928 SHOW.

Class.	BREED.	No. of Competitors.	Average Weight of Milk.			Total Weight of Milk.		Average Composition of Milk.					
			Fat.			Solids—not Fat.		Total Solids.					
			Morn.	Aft.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.
			lbs.	lbs.	lbs.	lbs.	%	%	%	%	%	%	%
1	Dairy Shorthorn—Pedigree	{ 6* 4†	24.7 20.0	25.3 20.3	— 20.5	50.0 60.8	3.44 3.61	3.53 3.95	— 3.97	8.76 9.29	8.77 9.08	12.20 12.87	12.29 13.01
2	Ditto (over 3 and under 5 years)	{ 11* 5†	21.8 16.0	22.9 16.4	— 16.1	44.7 48.5	3.28 3.25	3.93 3.73	— 3.73	9.00 9.17	8.87 8.82	12.18 12.42	12.78 12.56
3	Ditto Heifers	{ 8* 4†	16.0 11.8	15.8 10.8	— 11.9	31.8 34.5	3.98 4.38	3.53 3.48	— 4.15	9.18 9.19	9.12 8.91	12.59 13.07	— 12.39
4	Dairy Shorthorn—Non-Pedigree	... 2*	24.7	24.1	—	48.8	3.56	4.45	—	9.09	8.69	12.06	13.14
5	Ditto Heifers	{ 5* 3†	14.2 14.6	13.7 14.8	— 14.4	27.9 43.8	4.51 2.93	4.23 3.07	— 2.76	9.00 9.19	8.93 8.92	13.51 12.12	13.16 11.99
6	Lincoln Red Shorthorn	... 5†	20.4	21.1	19.9	61.4	3.73	4.27	3.59	8.99	9.01	12.73	13.29
7	Ditto Heifers	{ 3* 2†	19.2 14.7	18.7 15.0	— 14.1	37.9 43.8	4.74 4.26	4.87 4.13	— 3.72	9.49 8.99	9.56 9.16	14.23 13.28	14.43 13.80
8	British Friesian	... 11†	21.4	22.6	21.0	65.0	3.23	3.46	3.23	8.85	8.77	12.05	12.22
9	Ditto (over 3 and under 5 years)	... 6†	21.2	21.9	22.1	65.2	3.61	3.68	3.31	8.81	8.86	12.42	12.55
10	Ditto Heifers	... 9†	15.0	15.5	15.4	65.9	3.30	3.64	3.35	8.83	9.07	11.93	12.74
11	South Devon (Head Book Society)	... 2†	20.3	20.2	17.8	58.3	3.71	4.44	3.57	8.83	8.79	12.55	13.24
13	Ditto (Rec. Cattle Society)	... 5†	16.2	17.3	16.4	49.9	4.74	5.42	4.68	8.98	9.02	9.01	13.74
14	Devon	... 3*	10.6	10.3	—	20.9	4.42	4.58	—	9.12	9.31	13.54	13.56
15	Red Poll	{ 2* 3†	25.5 16.9	26.1 16.9	— 17.4	51.6 51.2	3.38 3.10	3.76 4.71	— 4.36	9.01 8.99	9.06 9.16	12.40 12.10	12.82 13.87
16	Ditto (over 3 and under 5 years)	{ 1* 12†	29.3 18.6	29.0 18.8	— 18.4	58.3 55.8	3.39 3.77	3.60 4.45	— 4.33	9.37 8.93	8.94 9.13	12.76 12.71	12.54 13.57

TABLE V.—QUANTITY AND QUALITY OF MILK. 1928 SHOW—Continued.

Class.	BREED.	No. of Competitors.	Average Weight of Milk.		Total Weight of Milk.		Average Composition of Milk.											
			Morn.		Aft.		Fat.		Solids—not Fat.						Total Solids.			
			lbs.	lbs.	lbs.	lbs.	%	%	%	%	%	%	%	%	%	%	%	%
17	Red Poll Heifers	5†	14.1	13.6	13.9	41.6	4.09	4.28	4.26	8.81	9.10	9.46	12.91	13.44	13.73	—	—	—
18	Blue Albion	2*	23.5	26.3	—	49.8	2.46	3.24	—	9.33	9.12	—	11.80	12.37	—	—	—	—
19	Ditto Heifers	1*	17.3	10.3	—	36.6	3.83	3.92	—	9.35	9.00	—	13.18	12.92	—	—	—	—
21	Ayrshire	{ 1* 14†	28.9 21.2	31.2 21.3	— —	60.1 64.3	4.52 3.91	4.98 4.29	— 3.93	9.12 8.98	8.96 9.11	9.24	13.64 12.87	13.94 13.40	13.18	—	—	—
22	Ditto Heifers	{ 1* 9†	14.0 16.9	13.9 16.3	— 16.5	27.9 49.7	3.75 3.86	4.45 3.92	— 3.81	9.27 9.13	8.85 9.20	— 9.39	13.02 12.86	13.20 13.10	13.31	—	—	—
23	Guernsey	3†	15.0	16.2	15.8	47.0	4.03	4.92	4.41	9.19	9.26	9.83	12.22	14.19	13.74	—	—	—
24	Ditto (over 3 and under 5 years)	{ 1* 4†	20.3 14.3	19.7 13.2	— 14.2	40.0 41.7	4.01 4.87	4.64 4.59	— 4.25	9.11 8.97	8.96 9.19	9.23	13.12 13.85	13.60 13.77	13.48	—	—	—
25	Ditto Heifers	{ 1* 3†	15.7 10.9	16.6 11.0	— 11.2	32.3 33.1	3.53 4.00	4.23 4.29	— 3.94	8.78 9.25	8.93 9.43	—	12.86 13.19	13.16 13.55	13.38	—	—	—
26	Jersey	{ 7* 4†	20.3 15.0	19.7 16.6	— 14.4	40.0 46.0	5.26 4.25	5.18 5.60	— 5.14	9.71 9.11	9.14 9.45	—	14.56 13.36	14.88 15.05	14.68	—	—	—
27	Ditto (over 3 and under 5 years)	{ 5* 4†	18.8 12.9	18.1 12.3	— 11.5	38.0 36.7	5.01 5.65	6.44 5.96	— 4.81	9.75 9.54	9.15 9.54	—	14.76 14.42	15.60 15.30	14.55	—	—	—
28	Ditto Heifers	{ 11* 1†	14.1 14.3	14.2 15.2	13.9	28.3 43.4	3.83	5.08	3.96	9.40	9.36	9.66	13.32	14.41	13.62	—	—	—
29	Kerry	{ 3* 1†	17.0 13.7	18.2 14.2	— 14.2	36.1 42.2	5.27 2.74	4.75 3.64	— 3.29	9.26 8.85	9.27 9.06	—	14.47 13.62	14.02 13.70	12.28	—	—	—
30	Ditto Heifers	{ 1* 2†	11.3 10.7	11.7 10.9	— 10.9	23.5 22.5	3.99 3.53	4.42 3.57	— 3.57	8.36 8.16	9.20 9.34	8.99	13.44 12.40	13.72 13.41	12.99	—	—	—
31	Dexter	{ 2* 2†	10.6 12.3	9.6 11.8	— 11.8	21.9 26.6	2.50 4.11	4.08 3.03	— 3.62	8.56 8.98	9.34 9.87	9.01	13.40 13.09	13.42 12.81	12.14	—	—	—
32	Dexter Heifer	{ 1* 1†	12.5 9.7	12.3 9.4	10.1	24.3 29.2	5.32 3.39	4.53 3.36	— 3.36	9.70 8.97	9.23 9.06	9.70	12.86	12.42	13.06	—	—	—

* Milked twice daily.

† Milked thrice daily.

TABLE VI.—NUMBER OF ANIMALS YIELDING MILK DEFICIENT IN FAT AND OTHER SOLIDS.

BREED AND CLASS.	Less than 3 per cent. of Fat.														Less than 8·5 per cent. of other Solids.					
	1915	1919	1920	1921	1922	1923	1924	1925	1926	1928	1915	1919	1920	1921	1922	1923	1924	1925	1926	1928
Dairy Shorthorn—Pedigree ...	0	5	3	4	6	2	1	2	0	0	0	0	0	1	0	2	1	0	1	0
Ditto (over 3 and under 5 years) ...	1	2	2	5	2	1	4	2	7	0	0	0	1	0	0	0	0	0	2	1
Ditto Heifers ...	4	1	2	1	0	0	3	0	4	0	0	0	0	0	1	1	0	0	4	0
Dairy Shorthorn—Non-Pedigree ...	1	1	0	2	1	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	5	2	0	3	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln Red Shorthorn ...	3	1	4	3	6	4	4	9	3	1	0	0	4	3	3	2	3	2	3	2
Ditto Heifers ...	5	2	1	0	10	4	1	3	2	0	0	0	2	1	0	0	0	0	0	0
British Friesian ...	3	12	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto (over 3 and under 5 years) ...	1	1	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Devon (Herd Book Society) ...	0	5	1	0	4	2	3	0	0	2	0	2	0	1	1	0	1	1	0	0
Ditto (Recorded Cattle Society) ...	3	1	1	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Devon ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Poll ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto (over 3 and under 5 years) ...	3	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Albion ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welsh Black ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ayrshire ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guernsey ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto (over 3 and under 5 years) ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jersey ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto (over 3 and under 5 years) ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kerry ...	0	1	1	0	2	1	1	1	2	0	0	1	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dexter ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ditto Heifers ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total ...	29	23	34	18	56	21	36	25	28	83	0	7	23	18	12	12	17	17	23	6
Number of Animals Examined	85	145	183	320	253	219	239	226	233	201	85	145	183	220	253	219	239	226	233	201

MILKING TRIALS, 1928.

CLASS 1.—DAIRY SHORTHORN COWS (ENTERED IN OR ELIGIBLE FOR COATES' HERD BOOK, OR ITS PEDIGREE SENT FOR SUCH ENTRY PREVIOUS TO THE SHOW. BORN ON OR PREVIOUS TO 1ST AUGUST, 1923).

Number Name	1 Plaspower Darlington 2nd.	2 Penwortham Lady Clara 2nd.	3 Lady Coral.	5 Lowgroves Spout 4th.	6 Rosamond Queen.	10 St. Clare Whitebud.
Born	Sept. 10, 1922. 1,404	July 31, 1923. 1,269	Sept. 15, 1922. 1,353	Sept. 14, 1921. 1,238	Oct. 30, 1922. 1,357	Mar. 22, 1923. 1,391
Live weight, in lbs.	Sept. 1. 1,404	Sept. 10. 1,269	Sept. 11. 1,353	Sept. 13. 1,238	Sept. 6. 1,357	Sept. 5. 1,391
Days since Calving	52	43	42	40	47	48
Weight of Milk, 1st day	Morn. Even. 24.8 29.7	Morn. Even. 18.3 18.6	Morn. Even. 26.8 26.6	Morn. Even. 26.3 26.2	Morn. Even. 22.6 23.9	Morn. Even. 28.9 25.3
Weight of Milk, 2nd day	27.5 26.0	19.4 19.7	26.7 26.6	29.6 30.4	23.6 25.4	24.9 23.3
Total	52.3 58.7	37.7 38.3	53.5 40.1	57.8 59.6	46.2 49.3	48.8 48.6
Average	26.15 29.35	18.85 19.15	26.75 24.55	28.9 29.8	23.1 24.65	24.4 24.3
Percentage of Fat	2.29 3.06	3.45 3.17	4.57 3.96	3.79 3.67	3.16 3.55	3.41 3.77
Percentage of Solids other than Fat	9.07 8.70	8.53 8.83	8.53 8.88	8.87 8.79	8.50 8.63	9.07 8.77
Percentage of Total Solids	11.36 11.76	11.98 12.00	13.10 12.84	12.66 12.46	11.66 12.18	12.48 12.54
Actual weight of Fat, in lbs.	0.6 0.90	0.65 0.605	1.23 0.975	1.065 1.10	0.73 0.875	0.83 0.92
Calculation of Points multiply by 20	12.0 18.0	13.0 12.1	24.6 19.5	21.9 22.0	14.6 17.5	16.6 18.4
Actual weight of Solids other than Fat, in lbs.	2.37 2.55	1.61 1.69	2.28 2.18	2.50 2.62	1.96 2.13	2.22 2.14
Calculation of Points multiply by 4	9.48 10.20	6.44 6.76	9.12 8.72	10.24 10.48	7.84 8.52	8.88 8.56
Points—	55.50	38.00	51.30	58.70	47.75	48.70
For weight of Milk (lbs.)	30.00	25.10	44.10	43.90	32.10	55.00
For weight of Fat (lbs. × 30)	19.68	13.20	17.84	20.72	16.36	17.44
For weight of Solids other than Fat (lbs. × 4)	105.18	70.30	113.24	123.32	96.21	101.14
Deductions	10.00	—	—	—	—	—
Total Points GAINED FOR MILK	95.18	70.30	113.24	123.32	96.21	101.14
Points for time since Calving	1.20	0.30	0.20	—	0.70	0.8
TOTAL POINTS GAINED	96.48	70.60	113.4	123.3	96.9	101.9
Points gained for Milk per 1,000 lbs. live weight	67.5	60.2	83.6	100.0	71.0	72.8
Points for time since Calving	1.2	0.3	0.2	—	0.7	0.8
Total Points per 1,000 lbs. live weight	68.7	60.5	83.8	100.0	71.7	73.6
Remarks and Awards	...	...	Highly Commended.	3rd Prize.	...	Highly Commended.

CLASS 1.—DAIRY SHORTHORN COWS (BORN ON OR PREVIOUS TO 1ST AUGUST, 1923)—Continued.

Number Name	14 Playford Julie.	15 Longhills Briar.				19 Dairyman's Girl.				20 Aldenham Woodnut.			
		Morn.	Aft.	Even.	Morn.	Aft.	Even.	Morn.	Aft.	Even.	Morn.	Aft.	Even.
Born	April 25, 1923.	19-3	18-8	18-3	18-5	21-8	17-6	19-7	20-6	21-5	20-2	22-3	20-2
Live weight, in lbs.	1,557	17-6	17-5	17-9	23-0	18-8	26-3	21-6	22-0	21-9	20-7	22-3	20-0
Last Calved	Sept. 22.	36-3	36-2	36-2	41-5	40-6	43-0	41-3	42-6	43-4	40-9	43-0	41-1
Days since Calving	31	18-45	18-15	18-1	20-75	20-3	21-95	20-65	21-3	21-7	20-45	21-5	20-55
Weight of Milk, 1st day		3-77	3-45	4-31	4-11	4-60	3-65	3-94	4-09	3-86	2-62	3-50	4-05
Weight of Milk, 2nd day		0-57	0-11	0-31	0-13	0-03	8-81	0-12	0-01	8-86	0-24	9-14	8-89
Total		13-24	12-50	13-62	13-24	13-73	12-46	13-06	13-10	12-72	11-86	12-64	12-94
Average		0-665	0-625	0-78	0-85	0-93	0-8	0-82	0-87	0-84	0-535	0-75	0-83
Percentage of Fat		13-9	12-5	15-6	17-0	19-0	16-0	16-4	17-4	16-8	10-7	15-0	16-6
Composition of Solids other than Fat		1-77	1-66	1-68	1-80	1-84	1-94	1-89	1-92	1-92	1-89	1-97	1-83
Actual weight of Solids other than Fat, in lbs.		7-08	6-64	6-72	7-56	7-36	7-76	7-56	7-68	7-08	7-56	7-88	7-32
Calculation of Points multiply by 4													
For weight of Milk (lbs.)		54-70			63-00			63-65				62-5	
For weight of Fat (lbs. $\times 20$)		42-00			52-00			50-60				42-3	
For weight of Solids other than Fat (lbs. $\times 4$)		20-44			22-68			22-92				22-76	
Total Points for Milk		117-1			137-7			137-2				127-6	
Deductions												10-0	
TOTAL POINTS GAINED FOR MILK		117-1			137-7			137-2				117-6	
Points for time since Calving					1-6							0-2	
TOTAL POINTS GAINED		117-1			139-3			137-2				117-8	
Points gained for Milk per 1,000 lbs. live weight		75-5			107-5			101-5				74-5	
Points for time since Calving					1-6							0-2	
Total Points per 1,000 lbs. live weight		75-5			109-1			101-5				74-7	
Remarks and Awards	Highly Commended.				1st Prize.			2nd Prize.				Reserve.	

CLASS 2.—DAIRY SHORTHORN COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925)—Continued.

Number Name	26 Sorbrook Summer Rose.	29 Clipston Duchess Rose 2nd.	30 Grendon Granite.	32 Thornby Duchess 4th.	33 Thornby Rosemund.
Born	Mar. 3, 1925.	May 8, 1924.	Aug. 27, 1924.	Aug. 21, 1924.	Feb. 4, 1925.
Live weight, in lbs.	1,106	1,294	1,374	1,336	1,114
Last Calved	Aug. 22.	July 9.	July 8.	Aug. 27.	Aug. 4.
Days since Calving	62	106	107	57	80
Weight of Milk, 1st day	Morn. Aft. Even.	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	17-3 18-9 16-0	27-8 28-6	10-7 12-3	23-9 26-4	20-5 22-4
	15-7 13-3 15-6	26-1 27-8	12-2 13-6	23-7 23-8	19-0 21-8
Total	33-0 34-2 31-6	53-9 56-4	22-9 25-9	47-6 50-2	39-5 44-2
Average	16-5 17-1 15-8	26-95 28-2	11-46 12-95	23-8 25-1	19-75 22-1
Percentage of Fat	2-15 3-25 4-92	2-78 2-80	3-07 3-38	2-40 3-81	2-03 3-21
Composition of Solids other than Fat	9-15 8-89 9-06	8-12 7-97	9-23 9-26	8-90 8-65	8-89 8-65
the Milk. (Total Solids	11-30 12-18 13-28	— —	12-30 12-64	11-30 12-36	11-52 11-86
Actual weight of Fat, in lbs.	0-355 0-57 0-67	— —	0-355 0-44	0-575 0-96	0-52 0-71
Calculation of Points multiply by 20	7-1 11-4 13-4	— —	7-1 8-8	11-5 19-2	10-4 14-2
Actual weight of Solids other than Fat, in lbs.	1-51 1-51 1-43	— —	1-06 1-20	2-13 2-15	1-75 1-91
Calculation of Points multiply by 4	6-04 6-04 5-72	— —	4-24 4-80	8-52 8-60	7-00 7-64
Points—					
For weight of Milk (lbs.)	49-40	—	24-40	48-9	41-85
For weight of Fat (lbs. × 20)	31-90	—	15-90	50-7	24-00
For weight of Solids other than Fat (lbs. × 4)	17-80	—	9-04	17-12	14-04
Total Points for Milk	99-1	—	40-34	96-72	81-09
Deductions	10-0	—	—	10-0	10-0
TOTAL POINTS GAINED FOR MILK	89-1	—	40-3	86-7	71-1
Points for time since Calving	2-2	—	6-7	1-7	4-0
TOTAL POINTS GAINED	91-3	—	56-0	88-4	75-1
Points gained for Milk per 1,000 lbs. live weight	80-6	—	38-8	65-0	64-3
Points for time since Calving	2-2	—	6-7	1-7	4-0
Total Points per 1,000 lbs. live weight	82-8	—	45-5	66-7	68-3
Remarks and Awards	Highly Commended.	Disqualified.		Highly Commended.	

CLASS 2.—DAIRY SHORTHORN COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925)—Continued.

Number Name ...	35 Prize Grey 3rd.	36 Haining Coral.	37 Risbridge Proctor 2nd.	40 Thornby Honey.	42 Great Tew Sophia.	43 Greatlow Sophia.
Born ...	Sept. 28, 1924 1,137 Oct. 5, 18	Sept. 13, 1923. 1,292 Oct. 6, 17	Oct. 13, 1924. 1,221 Sept. 13, 40	Mar. 4, 1925. 1,178 Sept. 20, 24	Sept. 14, 1924. 1,417 June 28, 117	Mar. 28, 1925. 1,280 Oct. 4, 19
Live weight, in lbs. ...	Morn. Even. 18-8 21-9	Morn. Even. 19-2 20-4	Morn. Even. 23-9 27-5	Morn. Even. 24-8 25-6	Morn. Even. 19-9 19-3	Morn. Even. 22-6 24-7
Last Calved ...	20-9 21-8	21-3 21-7	26-1 26-3	26-2 25-3	20-8 20-8	23-3 23-4
Days since Calving ...	39-7 43-7	40-5 42-1	50-0 53-8	51-0 50-9	40-7 40-1	47-9 48-1
Weight of Milk, 1st day	...	...	...	...	...	...
Weight of Milk, 2nd day	...	...	...	...	...	...
Total	...	...	...	...	...	...
Average	19-85 21-85	20-25 21-05	25-0 26-9	25-5 25-45	20-35 20-05	23-95 24-05
Percentage { Fat ...	3-60 4-61	4-83 5-75	3-05 3-61	3-37 4-52	3-83 3-95	3-81 4-04
Composition of { Solids other than Fat ...	9-10 8-81	9-35 9-37	9-27 9-31	9-03 8-54	8-85 8-71	9-35 9-28
the Milk. { Total Solids ...	12-70 13-42	14-18 15-12	12-32 12-92	12-40 13-06	12-68 12-66	13-16 13-32
Actual weight of Fat, in lbs. ...	0-71 1-01	0-98 1-21	0-76 0-97	0-86 1-15	0-78 0-765	0-91 0-97
Calculation of Points multiply by 20 ...	14-2 20-2	19-6 24-2	15-2 19-4	17-2 23-0	15-6 15-9	18-2 19-4
Actual weight of Solids other than Fat, in lbs. ...	1-80 1-93	1-89 1-98	2-32 2-50	2-30 2-17	1-81 1-75	2-24 2-24
Calculation of Points multiply by 4 ...	7-20 7-72	7-56 7-92	9-28 10-00	9-20 8-68	7-24 7-00	8-96 8-92
Points { For weight of Milk (lbs.) ...	41-70	41-30	51-90	50-05	40-40	48-00
For weight of Fat (lbs. x 20) ...	34-40	43-80	34-60	40-20	31-50	37-00
For weight of Solids other than Fat (lbs. x 4) ...	14-92	15-48	19-28	17-88	14-22	17-88
Total Points for Milk ...	91-02	100-58	105-78	109-03	86-1	103-5
Deductions ...	...	...	...	...	...	...
TOTAL POINTS GAINED FOR MILK	91-02	100-58	105-78	109-03	86-1	103-5
Points for time since Calving ...	...	...	...	...	...	...
TOTAL POINTS GAINED	91-02	100-58	105-78	109-03	93-8	103-5
Points gained for Milk per 1,000 lbs. live weight ...	80-3	81-8	86-6	92-7	91-5	84-3
Points for time since Calving ...	...	...	...	...	...	...
Total Points per 1,000 lbs. live weight	80-3	81-8	86-6	92-7	89-2	84-3
Remarks and Awards ...	Highly Commended.	Highly Commended.	Reserve.	3rd Prize.	Highly Commended.	Highly Commended.

CLASS 2.—DAIRY SHORTHORN COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925)
—Continued.

Number Name	47 Brilliant Gwynne.	50 Copsale Johnby.	51 Overcover Greenleaf.	52 Cowfold Joyful.	53 Barshaw Baroness.	57 Rockier Water- loo Sunset.
Born	May 20, 1924. 1,141	Sept. 28, 1925. 1,112	May 7, 1926. 903	Oct. 22, 1925. 1,214	Jan. 2, 1926. 972	Jan. 6, 1926. 1,170
Live weight, in lbs.	23.8	15.5	17.4	13.2	17.8	14.8
Last Calved	Sept. 23. 30	Sept. 11. 42	Sept. 27. 26	June 17. 128	Sept. 24. 29	Aug. 24. 60
Days since Calving	...	...	...	...	...	...
Weight of Milk, 1st day	Morn. Even. 22.1 23.8	Morn. Even. 15.5 16.9	Morn. Even. 17.4 18.6	Morn. Even. 13.2 14.3	Morn. Even. 18.1 17.8	Morn. Even. 14.8 15.7
Weight of Milk, 2nd day	24.3 25.0	16.6 15.8	18.7 18.7	16.4 15.0	18.9 17.3	14.7 14.8
Total	46.4 48.8	32.1 32.7	36.1 37.3	29.6 29.3	37.0 35.1	29.5 30.5
Average	23.2 24.4	16.05 16.35	18.05 18.65	14.8 14.65	18.5 17.55	14.75 15.25
Percentage { Fat	2.67 3.23	3.90 4.05	3.18 3.23	3.06 3.67	4.07 3.63	4.31 2.91
Composition of { Solids other than Fat	8.89 9.09	9.16 8.73	9.30 8.91	9.40 9.45	9.13 9.11	8.80 8.80
the Milk. { Total Solids	11.56 12.32	13.06 12.78	12.48 12.24	13.30 13.12	13.20 12.74	13.18 12.80
Actual weight of Fat, in lbs.	0.625 0.79	0.625 0.66	0.575 0.62	0.59 0.54	0.755 0.64	0.63 0.565
Calculation of Points multiply by 20	12.5 15.8	12.5 13.2	11.5 12.4	11.8 10.8	15.10 12.8	12.6 11.9
Actual weight of Solids other than Fat, in lbs.	2.06 2.22	1.47 1.43	1.68 1.66	1.39 1.385	1.69 1.60	1.3 1.355
Calculation of Points multiply by 4	8.24 8.88	5.88 5.72	5.72 6.64	5.56 5.540	6.76 6.4	5.2 5.420
Points—						
For weight of Milk (lbs.)	47.00	22.40	36.70	30.45	30.05	30.00
For weight of Fat (lbs. × 20)	28.20	23.00	23.00	22.00	27.90	24.00
For weight of Solids other than Fat (lbs. × 4)	17.12	11.60	13.36	11.10	13.16	10.62
Total Points for Milk	92.9	69.70	74.0	63.2	77.1	65.1
Deductions	10.0	—	—	—	—	—
TOTAL POINTS GAINED FOR MILK	82.9	69.70	74.0	63.2	77.1	65.1
Points for time since Calving	—	0.2	—	8.8	—	2.00
TOTAL POINTS GAINED	82.9	69.9	74.0	72.0	77.1	67.1
Points gained for Milk per 1,000 lbs. live weight	72.7	62.6	83.2	52.0	79.4	55.6
Points for time since Calving	—	0.2	—	8.8	—	2.0
Total Points per 1,000 lbs. live weight	72.7	62.8	83.2	60.8	79.4	57.6
Remarks and Awards	...	Highly Commended.	Highly Commended.	Highly Commended.	Reserve.	Highly Commended.

CLASS 3.—DAIRY SHORTHORN HEIFERS (ENTERED IN OR ELIGIBLE FOR COATES' HERD BOOK. BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF).

CLASS 3.—DAIRY SHORTHORN HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

Number Name	58 St. Clare Daiford 7th.	59 Greatest Janette.	62 Madeley Darlington 5th.	64 Longhills Darlington 5th.	65 Longhills Barmington Empress 2nd.
Born	March 24, 1926. 1,013 Sept. 10. 43	May 15, 1926. 1,146 Sept. 8. 43	March 9, 1926. 1,050 Sept. 1. 32	September 8, 1925. 1,086 June 21. 124	September 8, 1925. 1,089 July 3. 112
Live weight, in lbs.
Last calved
Days since Calving
Weight of Milk, 1st day
Weight of Milk, 2nd day
Total
Average
Percentage of Fat
Composition of the Milk.
Actual weight of Fat, in lbs.
Calculation of Points multiply by 20
Actual weight of Solids other than Fat, in lbs.
Calculation of Points multiply by 4
For weight of Milk (lbs.)
For weight of Fat (lbs. × 20)
For weight of Solids other than Fat (lbs. × 4)
Total Points for Milk
Deductions
TOTAL POINTS GAINED FOR MILK
Points for time since Calving
TOTAL POINTS GAINED
Points gained for Milk per 1,000 lbs. live weight
Points for time since Calving
Total Points per 1,000 lbs. live weight
Remarks and Awards	...	Highly Commended.	...	3rd Prize.	1st Prize.

CLASS 4.—DAIRY SHORTHORN COWS (NOT ELIGIBLE FOR CLASSES 1 OR 2).

Number Name ...	...	...	...	...	...	74 Dossie.	75 Dora.
Born ...	...	...	...	...	...	1922.	—
Live weight, in lbs. ...	...	...	...	...	...	1,516	1,142
Last Calved ...	...	...	...	...	...	Sept. 7.	Sept. 1.
Days since Calving ...	...	...	...	...	...	46	52
Weight of Milk, 1st day ...	...	...	...	...	...	Morn. 23.4 Even. 25.5	Morn. 21.6 Even. 23.0
Weight of Milk, 2nd day ...	...	...	...	...	...	20.9	22.2
Total ...	...	...	...	...	...	55.3	43.8
Average ...	...	...	...	...	...	27.65	21.9
Percentage { Fat ...	...	...	...	...	...	3.76	3.37
Composition of { Solids other than Fat ...	...	...	...	...	...	8.86	9.33
the Milk. { Total Solids ...	...	...	...	...	...	12.62	12.70
Actual weight of Fat, in lbs. ...	...	...	...	...	...	1.04	0.74
Calculation of Points multiply by 20 ...	...	...	...	...	...	20.8	14.8
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	2.45	2.04
Calculation of Points multiply by 4 ...	...	...	...	...	...	9.80	8.10
Points—	...	...	...	...	...	...	...
For weight of Milk (lbs.) ...	...	...	...	...	...	54.05	43.85
For weight of Fat (lbs. \times 20) ...	...	...	...	...	...	41.30	37.80
For weight of Solids other than Fat (lbs. \times 4) ...	...	...	...	...	...	19.04	15.76
Total Points for Milk ...	...	...	...	...	...	114.4	97.4
Deductions ...	...	...	...	...	...	—	—
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	...	114.4	97.4
Points for time since Calving ...	...	...	...	...	...	0.6	1.2
TOTAL POINTS GAINED ...	...	...	...	...	...	115.0	98.6
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	...	74.0	85.2
Points for time since Calving ...	...	...	...	...	...	0.6	1.2
Total Points per 1,000 lbs. live weight ...	...	...	...	...	...	74.6	86.4
Remarks and Awards ...	...	...	...	...	...	1st Prize.	...

CLASS 5.—DAIRY SHORTHORN HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF, NOT ELIGIBLE FOR CLASS 3).

Number Name	...	...	...	...	78 Rose.	79 Pearl.	83 Ascots Mary.	85 Mertymaid.	86 St. Clare Rachel 3rd.
Born	...	...	...	...	Oct. 5, 1925. 1,080	Nov. 26, 1925. 1,128 Oct. 3, 20	1,257 Sept. 14, 29	1926, 1,103 June 28, 117	May 19, 1926. 1,033 Oct. 5, 18
Live weight, in lbs.	...	...	...	...	...	...	...	...	...
Last Calved	...	...	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	Morn. Even. 20.1 15.6	Morn. Even. 11.6 12.7	Morn. Even. 12.8 12.8	Morn. Even. 12.6 12.2	Morn. Even. 13.5 14.4
Weight of Milk, 2nd day	...	...	...	...	20.1 21.7	10.9 10.5	10.8 9.7	13.1 12.9	14.7 15.2
Total	...	...	...	...	40.2 37.3	22.5 23.2	23.6 22.5	25.7 25.1	28.2 29.6
Average	...	...	...	...	20.1 18.65	11.25 11.6	11.8 11.25	12.85 12.55	14.1 14.8
Percentage. { Fat	...	...	...	...	2.68 3.23	3.97 4.12	6.04 6.61	4.24 3.02	4.50 4.18
Composition of { Solids other than Fat	...	...	...	...	8.58 8.51	9.21 9.04	9.08 9.01	8.68 8.80	9.46 9.28
the Milk. { Total Solids	...	...	...	...	12.26 11.74	13.18 13.16	15.12 13.62	13.02 11.82	13.06 13.46
Actual weight of Fat, in lbs.	...	...	...	...	0.745 0.60	0.45 0.48	0.715 0.715	0.555 0.38	0.635 0.62
Calculation of Points multiply by 20	...	...	...	...	14.9 12.0	9.0 9.6	14.3 14.9	11.1 7.6	12.7 12.4
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	1.73 1.59	1.04 1.05	1.07 1.01	1.12 1.10	1.24 1.375
Calculation of Points multiply by 4	...	...	...	...	6.92 6.36	4.16 4.2	4.28 4.04	4.48 4.40	5.36 5.50
For weight of Milk (lbs.) ...	...	...	...	...	38.75	22.85	33.05	25.40	38.40
For weight of Fat (lbs. \times 20)	...	...	...	...	26.80	18.00	29.20	18.70	27.10
For weight of Solids other than Fat (lbs. \times 4)	...	...	...	...	13.28	3.36	8.32	3.88	10.86
Total Points for Milk	...	...	...	...	78.8	49.8	60.6	53.0	64.9
Deductions	...	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED FOR MILK	...	...	...	...	78.8	49.8	60.6	53.0	64.9
Points for time since Calving	...	...	...	...	...	...	...	7.7	...
TOTAL POINTS GAINED	...	...	...	...	78.8	49.8	60.6	60.7	64.9
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	73.0	44.2	48.2	48.0	62.7
Points for time since Calving	...	...	...	...	...	...	...	7.7	...
Total Points per 1,000 lbs. live weight	...	...	...	...	73.0	44.2	48.2	55.7	62.7
Remarks and Awards	...	...	...	...	2nd Prize.	...	...	...	...

CLASS 5.—DAIRY SHORTHORN HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

Number	...	...	...	...	...	87	...	88	...	89
Name	...	...	...	...	...	Part 3rd.	...	Cassie 2nd.	...	Stokelycross Frolic 4th.
Born	...	...	...	...	...	Jan. 28, 1926.	...	Aug. 27, 1925.	...	Nov. 17, 1925.
Live weight, in lbs.	...	...	...	...	...	1,038	...	1,183	...	1,222
Last Calving	...	...	...	...	...	June 6.	...	July 14.	...	Aug. 13.
Days since Calving	...	...	...	...	...	109	...	101	...	71
Weight of Milk, 1st day	...	...	...	...	...	Morn. Aft. Even.	...	Morn. Aft. Even.	...	Morn. Aft. Even.
Weight of Milk, 2nd day	...	...	...	...	...	11.6 13.7 12.3	...	15.8 18.2 17.6	...	15.2 14.6 14.2
	...	...	...	...	...	12.7 12.7 11.6	...	16.6 15.7 15.2	...	13.9 14.2 15.8
Total	...	...	...	...	...	24.3 26.4 23.9	...	32.4 33.9 32.8	...	29.1 28.8 30.0
Average	...	...	...	...	...	12.15 13.2 11.95	...	16.2 16.95 16.4	...	14.55 14.4 15.0
Percentage	...	...	...	...	...	2.44 3.03 2.41	...	2.51 2.89 2.59	...	3.84 3.29 3.29
Composition of	...	...	...	...	...	9.54 9.07 9.05	...	9.27 8.89 8.81	...	8.78 8.81 8.05
the Milk.	...	...	...	...	...	11.98 12.10 11.46	...	11.78 11.40 11.40	...	12.62 12.10 12.24
Actual weight of Fat, in lbs.	...	...	...	...	...	0.30 0.4 0.29	...	0.41 0.49 0.425	...	0.36 0.475 0.495
Calculation of Points multiply by 20	...	...	...	...	...	6.0 8.0 5.8	...	8.2 9.8 8.50	...	11.2 9.5 9.9
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	1.16 1.2 1.08	...	1.50 1.52 1.45	...	1.28 1.27 1.34
Calculation of Points multiply by 4	...	...	...	...	...	4.64 4.8 4.32	...	6.0 6.08 5.8	...	5.12 5.08 5.36
For weight of Milk (lbs.)	...	...	...	...	...	37.80	...	49.55	...	43.05
For weight of Fat (lbs. x 20)	...	...	...	...	...	19.80	...	20.50	...	30.00
For weight of Solids other than Fat (lbs. x 4)	...	...	...	...	...	13.76	...	17.84	...	13.56
Total Points for Milk	...	...	...	...	...	70.9	...	93.9	...	90.1
Deductions	...	...	...	...	...	20.0	...	30.0	...	—
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	50.9	...	63.9	...	90.1
Points for time since Calving	...	...	...	...	...	6.9	...	6.1	...	3.1
TOTAL POINTS GAINED	...	...	...	...	...	57.8	...	70.0	...	93.2
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	49.0	...	54.1	...	73.7
Points for time since Calving	...	...	...	...	...	6.9	...	6.1	...	3.1
Total Points per 1,000 lbs. live weight	...	...	...	...	...	55.9	...	60.2	...	76.8
Remarks and Awards	...	...	...	...	...		...		...	1st Prize.

CLASS 6.—LINCOLNSHIRE RED SHORTHORN COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK OF THE LINCOLNSHIRE RED SHORTHORN ASSOCIATION).

Number Name ..	..	..	..	..	90 Bendish Gem 11th.	92 Burton Young Cherry 9th.	93 Burton Sylvia 2nd.	95 Burton Red Rose 6th.
Born ..	..	..	..	..	Feb. 14, 1924. 1,334 Sept. 19. 34	Aug. 18, 1922. 1,478 Sept. 13. 40	Oct. 5, 1923. 1,291 Sept. 18. 35	Aug. 17, 1924. 1,276 Sept. 21. 32
Live weight, in lbs. ...	..	..	..	..	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Last Calved ..	..	..	..	..	17-9 19-8 18-8	20-2 21-4 20-5	16-2 17-4 14-5	25-0 25-3 22-7
Days since Calving ..	..	..	..	..	18-6 19-4 18-9	20-1 19-2 18-5	15-6 17-6 13-4	23-2 25-1 21-4
Weight of Milk, 1st day ..	..	..	..	..	36-5 39-2 37-7	40-3 40-6 39-0	31-8 35-0 29-9	48-2 50-4 44-1
Weight of Milk, 2nd day ..	..	..	..	..	18-28 19-6 18-85	20-15 20-3 19-5	15-9 17-5 14-95	24-1 25-2 22-05
Total ..	..	..	..	..	2-67 3-49 3-06	3-81 3-61 3-39	3-04 4-08 3-70	3-42 4-62 3-18
Average ..	..	..	..	..	9-05 8-36 8-00	9-07 9-21 8-07	9-08 9-06 8-91	8-70 8-54 8-62
Percentage { Fat ..	..	..	..	..	11-72 12-24 11-00	12-88 12-82 12-36	13-02 13-14 12-70	12-12 13-16 11-80
Composition of { Solids other than Fat ..	..	..	..	..	0-40 0-685 0-58	0-77 0-735 0-66	0-625 0-72 0-565	0-82 1-17 0-70
Total Solids ..	..	..	..	..	9-8 13-7 11-6	15-4 14-7 13-2	12-5 14-4 11-3	16-4 23-4 24-0
Actual weight of Fat, in lbs. ...	..	..	..	..	1-645 1-74 1-68	1-83 1-88 1-75	1-44 1-59 1-34	2-10 2-18 1-90
Calculation of Points multiply by 20 ..	..	..	..	..	6-58 6-96 6-72	7-32 7-52 7-00	5-76 6-36 5-36	8-4 8-00 7-6
Actual weight of Solids other than Fat, in lbs. ...	..	..	..	..	56-70	59-95	48-35	71-35
Calculation of Points multiply by 4 ..	..	..	..	..	35-10	43-30	38-20	53-80
For weight of Milk (lbs.) ...	..	..	..	..	20-26	21-84	17-48	24-60
For weight of Fat (lbs. × 20) ..	..	..	..	..	112-1	125-1	101-0	149-8
For weight of Solids other than Fat (lbs. × 4) ..	..	..	..	..	10-6	—	—	—
Total Points for Milk ..	..	..	..	..	102-1	125-1	104-0	149-8
Deductions ..	..	..	..	..	—	—	—	—
TOTAL POINTS GAINED FOR MILK ..	..	..	..	..	102-1	125-1	104-0	149-8
Points for time since Calving ..	..	..	..	..	76-6	85-0	80-8	117-8
TOTAL POINTS GAINED ..	..	..	..	..	76-6	85-0	80-8	117-8
Points gained for Milk per 1,000 lbs. live weight ..	..	..	..	..	—	—	—	—
Points for time since Calving ..	..	..	..	..	—	—	—	—
Total Points per 1,000 lbs. live weight, ..	..	..	..	..	—	—	—	—
Remarks and Awards ..	..	..	..	..	Highly Commended.	3rd Prize.	Reserve.	2nd Prize.

CLASS 7.—LINCOLNSHIRE RED SHORTHORN HEIFERS
(ENTERED IN OR ELIGIBLE FOR THE HERD BOOK OF THE
LINCOLNSHIRE RED SHORTHORN ASSOCIATION. BORN ON OR
AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF).

Number Name	96 Langford Damsel 21st.	100 Burton Rosemary 20th.	102 Burton Hempy 12th.	104 Histon Duchess 11th.
Born	Dec. 9, 1921. 270	Nov. 25, 1925. 1,340	Sept. 27, 1925. 1,386	Sept. 28, 1925. 1,377
Live weight, in lbs.	Sept. 27. 26	Sept. 9. 44	Sept. 7. 46	Oct. 7. 16
Last Calved	...	...	...	...
Days since Calving	...	...	...	...
Weight of Milk, 1st day	Morn. 23-8 Aft. 21-9 Even. 24-2	Morn. 14-3 Aft. 15-2 Even. 14-0	Morn. 15-8 Aft. 15-8 Even. 14-8	Morn. 16-4 Aft. 15-8 Even. 15-3
Weight of Milk, 2nd day	24-1 24-3 24-1	13-8 14-1 13-7	15-0 15-0 14-0	16-3 15-3 15-3
Total	47-9	46-2	48-3	...
Average	23-05	23-1	24-15	...
Percentage of Fat	4-83	5-56	8-54	...
Composition of Milk.	9-07 13-96 1-16	8-40 14-06 0-855	8-40 12-84 0-66	...
Actual weight of Fat, in lbs.	...	...	...	...
Calculation of Points multiply by 20	23-2	25-8	17-1	...
Actual weight of Solids other than Fat, in lbs.	2-17	2-18	2-15	...
Calculation of Points multiply by 4	8-68	8-72	8-6	...
For weight of Milk (lbs.)	71-20	66-10	66-10	...
For weight of Fat (lbs. x 20)	26-00	26-00	15-72	...
For weight of Solids other than Fat (lbs. x 4)	...	...	...	...
Total Points for Milk	163-3	163-3	163-3	...
Deductions	...	...	...	...
TOTAL POINTS GAINED FOR MILK	163-3	163-3	163-3	...
Points for time since Calving	...	...	...	...
TOTAL POINTS GAINED	163-3	163-3	163-3	...
Points gained for Milk per 1,000 lbs. live weight	128-5	128-5	128-5	...
Points for time since Calving	...	...	...	...
Total Points per 1,000 lbs. live weight	128-5	128-5	128-5	...
Remarks and Awards	...	...	...	...
	1st Prize.	3rd Prize.	2nd Prize.	Highly Commended.

CLASS 7.—LINCOLNSHIRE RED SHORTHORN HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

Number Name ...	...	...	...	...	...	105 Langford Damself 34th.	106 Langford Heaven 12th.
Born ...	...	...	...	...	...	Sept. 12, 1925.	Oct. 19, 1925.
Live weight, in lbs. ...	...	...	...	...	...	963	1,138
Last Calving ...	...	...	...	...	...	Oct. 1.	Oct. 9.
Days since Calving ...	...	...	...	...	...	22	14
Weight of Milk, 1st day ...	...	...	...	...	...	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ...	...	...	...	...	...	18-9 18-3	21-7 21-4
	...	...	...	...	...	18-8 18-0	23-0 22-9
Total ...	...	...	...	...	...	37-7 36-9	44-7 44-3
Average ...	...	...	...	...	...	18-85 18-45	22-35 22-15
Percentage { Fat ...	...	...	...	...	...	4-58 4-39	5-37 5-36
Composition of { Solids other than Fat ...	...	...	...	...	...	9-20 9-35	9-39 9-04
the Milk, { Total Solids ...	...	...	...	...	...	13-78 13-74	14-96 15-30
Actual weight of Fat, in lbs. ...	...	...	...	...	...	0-865 0-81	1-20 1-13
Calculation of Points multiply by 20 ...	...	...	...	...	...	17-3 16-2	24-0 23-8
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	1-74 1-725	2-15 2-20
Calculation of Points multiply by 4 ...	...	...	...	...	...	6-96 6-90	8-6 8-8
Points—	...	...	...	...	...	...	...
For weight of Milk (lbs.) ...	...	...	...	...	...	37-30	44-50
For weight of Fat (lbs. \times 20) ...	...	...	...	...	...	33-50	47-80
For weight of Solids other than Fat (lbs. \times 4) ...	...	...	...	...	...	13-86	17-40
Total Points for Milk ...	...	...	...	...	...	84-7	109-7
Deductions ...	...	...	...	...	...	—	—
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	...	84-7	109-7
Points for time since Calving ...	...	...	...	...	...	—	—
TOTAL POINTS GAINED ...	...	...	...	...	...	84-7	109-7
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	...	88-0	96-5
Points for time since Calving ...	...	...	...	...	...	—	—
Total Points per live weight 1,000 lbs. ...	...	...	...	...	...	88-0	96-5
Remarks and Awards ...	...	...	...	...	...	Reserve.	1st Prize.

CLASS 8.—BRITISH FRIESIAN COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR PREVIOUS TO 1ST AUGUST, 1923).

Number Name ...	108 Petygars Blackberry.	109 Imad (imp. 1922) Blanche 22nd.	111 Lund Juliet.	114 Stidbourne Flossetwijk.
Born ...	Aug. 30, 1919, 1.531	April 26, 1921, 1.434	June 30, 1922, 1.758	Sept. 10, 1920, 1.562
Live weight, in lbs. ...	1.531	July 7, 1.08	Sept. 16, 37	Sept. 23, 30
Last Calved ...	Sept. 22, 81			
Days since Calving ...				
Weight of Milk, 1st day ...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Weight of Milk, 2nd day ...	23.3 26.9 25.0	19.2 18.4 18.8	18.8 18.7 19.0	20.6 20.1 28.3
	24.8 26.7 23.5	19.6 18.5 18.0	19.6 19.9 18.9	27.3 25.3 27.6
Total	48.1 53.6 48.5	38.8 36.9 36.8	38.4 38.6 37.9	56.9 54.6 56.1
Average	24.05 26.8 24.25	19.4 18.45 18.4	19.2 19.3 18.95	28.45 27.3 28.05
Percentage Fat	2.55 3.00 2.65	4.46 3.96 3.54	3.11 2.56 2.55	2.93 3.36 3.87
Composition of Solids other than Fat	8.75 8.58 8.61	8.90 8.98 8.86	8.19 7.90 7.99	8.65 8.64 8.21
the Milk, Total Solids	11.30 11.58 11.26	13.36 12.94 12.40	11.30 10.46 10.54	11.58 12.00 12.08
Actual weight of Fat, in lbs.	0.61 0.81 0.64	0.865 0.73 0.65	— — —	0.835 0.92 1.09
Calculation of Points multiply by 20	12.2 16.2 12.8	17.3 14.6 13.0	— — —	16.7 18.4 21.8
Actual weight of Solids other than Fat, in lbs.	2.10 2.3 2.1	1.72 1.66 1.63	— — —	2.47 2.36 2.31
Calculation of Points multiply by 4	8.40 9.2 8.4	6.88 6.64 6.52	— — —	9.88 9.44 9.24
For weight of Milk (lbs.) ...	75.10	59.25	—	83.80
For weight of Fat (lbs. $\times 20$) ...	41.20	44.00	—	56.00
For weight of Solids other than Fat (lbs. $\times 4$) ...	20.00	20.04	—	28.56
Total Points for Milk	142.30	121.2	—	169.3
Deductions	20.0	—	—	20.0
TOTAL POINTS GAINED FOR MILK	122.3	121.2	—	149.3
Points for time since Calving	—	6.5	—	—
TOTAL POINTS GAINED	122.3	127.7	—	149.3
Points gained for Milk per 1,000 lbs. live weight	80.4	85.0	—	94.0
Points for time since Calving	—	6.5	—	—
Total Points per 1,000 lbs. live weight	80.4	91.5	—	94.0
Remarks and Awards	Highly Commended.	Highly Commended.	Disqualified.	2nd Prize.

CLASS 8.—BRITISH FRIESIAN COWS (BORN ON OR PREVIOUS TO 1ST AUGUST, 1923)—Continued.

Number Name	119 Brooklands Barbara.	120 Terling Unique.	122 Terling Bella Donna 11th.	123 Brislington Ganna.
Born	Oct. 25, 1920. 1,391	Jan. 14, 1920. 1,380	Aug. 6, 1922. 1,414	June 19, 1921. 1,503
Live weight, in lbs.	June 29, 116	Sept. 11, 42	Sept. 22, 31	Sept. 16, 57
Last Calved				
Days since Calving				
Weight of Milk, 1st day	Morn. 11-1 Aft. 16-0 Even. 13-0	Morn. 25-0 Aft. 25-6 Even. 22-3	Morn. 24-2 Aft. 22-7 Even. 25-3	Morn. 25-5 Aft. 26-2 Even. 26-2
Weight of Milk, 2nd day	13-2 13-5 13-5	22-7 23-7 23-9	22-9 23-2 23-9	15-6 28-6 12-1
Total	24-3 29-5 26-5	47-7 49-3 46-2	47-1 45-9 49-2	41-1 54-8 31-9
Average	12-15 14-75 13-25	23-85 24-65 23-1	23-55 22-95 24-6	20-55 27-4 15-95
Percentage Composition of the Milk.	2-85 9-53 9-13	3-42 4-69 8-97	3-33 2-72 3-01	3-44 4-50 3-12
Actual weight of Fat, in lbs.	12-40 12-56 11-74	12-32 13-37 14-06	12-06 11-68 11-70	12-28 13-36 11-78
Calculation of Points multiply by 20	0-345 0-51 0-405	0-81 1-16 1-36	0-79 0-625 0-74	0-71 1-23 0-50
Actual weight of Solids other than Fat, in lbs.	6-9 10-2 8-8	10-3 23-2 27-2	15-8 12-5 14-8	14-2 24-6 10-0
Calculation of Points multiply by 4	1-16 1-35 1-15	2-12 2-14 2-03	2-06 2-05 2-13	1-82 2-43 1-38
For weight of Milk (lbs.)	4-64 5-40 4-0	8-48 8-56 8-12	8-24 8-20 8-52	7-28 9-72 5-52
For weight of Fat (lbs. $\times 20$)	40-15 25-20 14-64	71-60 66-70 25-16	71-10 43-10 24-96	63-90 48-80 52-52
For weight of solids other than Fat (lbs. $\times 4$)				
Total Points for Milk	80-0 10-0	163-5 —	139-2 10-0	135-2 —
Deductions				
TOTAL POINTS GAINED FOR MILK	70-0	163-5	129-2	135-2
Points for time since Calving	7-6	0-2	—	—
TOTAL POINTS GAINED	77-6	163-7	129-2	135-2
Points gained for Milk per 1,000 lbs. live weight	50-3	118-5	91-6	85-1
Points for time since Calving	7-6	0-2	—	—
Total Points per 1,000 lbs. live weight	57-9	118-7	91-6	85-1
Remarks and Awards		1st Prize.	Highly Commended.	Reserve.

CLASS 8.—BRITISH FRIESIAN COWS (BORN ON OR PREVIOUS TO 1ST AUGUST, 1923)—Continued.

Number Name ...	124 Mapleton Grace.	132 Parks Lucky 4th.	131 Northern Bonnie Annie.
Born ...	Sept. 16, 1922. 1,521	April 20, 1923. 1,575	Mar. 21, 1921. 1,495
Five weight, in lbs. ...	Sept. 18, 35	Sept. 1, 32	June 17, 128
Last Calved ...			
Days since Calving ...			
Weight of Milk, 1st day ...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Weight of Milk, 2nd day ...	22.3 25.2 22.6	27.2 26.2 26.7	15.4 15.6 14.6
	22.1 25.0 22.5	25.7 26.2 26.2	16.4 15.9 16.1
Total ...	44.4 50.2 45.1	52.9 52.4 52.9	31.8 31.5 30.7
Average ...	22.2 25.1 22.55	26.45 26.2 26.45	15.9 15.75 15.35
Percentage { Fat ...	2.45 2.98 1.84	3.41 3.23 2.95	3.49 3.62 3.13
Composition of { Solids other than Fat ...	8.65 8.81 8.90	8.67 8.61 8.69	9.33 9.38 8.99
the Milk. { Total Solids ...	11.10 11.79 10.74	12.08 11.84 11.64	12.82 13.00 12.12
Actual weight of Fat, in lbs. ...	0.54 0.75 0.415	0.80 0.845 0.78	0.555 0.57 0.48
Calculation of Points multiply by 20 ...	10.8 15.0 8.3	18.0 16.9 15.6	11.1 11.4 9.6
Actual weight of Solids other than Fat, in lbs. ...			
Calculation of Points multiply by 4 ...	1.92 2.22 1.02	2.20 2.26 2.30	1.48 1.48 1.38
Points—			
For weight of Milk (lbs.) ...	7.68 8.88 7.68	9.16 9.04 9.2	5.92 5.92 5.62
For weight of Fat (lbs. × 20) ...	69.85	79.10	47.00
For weight of Solids other than Fat (lbs. × 4) ...	34.10	50.50	32.10
	24.20	27.40	17.36
Total Points for Milk ...	128.2	157.0	90.5
Deductions ...	30.0	10.0	—
TOTAL POINTS GAINED FOR MILK ...	98.2	147.0	90.5
Points for time since Calving ...	—	1.2	8.8
TOTAL POINTS GAINED ...	98.2	148.2	105.3
Points gained for Milk per 1,000 lbs. live weight ...	64.5	94.2	64.4
Points for time since Calving ...	—	1.2	8.8
Total Points per 1,000 lbs. live weight ...	64.5	95.4	73.2
Remarks and Awards ...	3rd Prize.		

CLASS 9.—BRITISH FRIESIAN COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK.
BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925).

Number Name	135 Holyport Unity.	136 Isken Dairymaid 4th.	138 Hameels Paula.	140 Hastington Frisky.
Born	Jan. 5, 1924. 1,487	Nov. 12, 1924. 1,328	Feb. 27, 1925. 1,526	Aug. 2, 1923. 1,271
Live weight, in lbs.	20-3	24-2	14-3	25-4
Last Calved	Sept. 24. 29	Aug. 22. 62	Aug. 8. 76	Oct. 2. 21
Days since Calving	...	...	...	...
Weight of Milk, 1st day	Morn. 27-8 Aft. 20-3	Morn. 22-2 Aft. 24-2	Morn. 13-8 Aft. 14-3	Morn. 25-4 Aft. 25-4
Weight of Milk, 2nd day	29-0 31-1	28-5 23-1	16-6 16-6	25-9 26-6
Total	56-8 60-4	50-7 47-3	31-1 34-3	51-3 52-0
Average	28-4 30-2	25-35 24-65	15-55 17-15	25-05 25-65
Percentage of Fat	3-27 8-55	3-45 8-03	4-33 9-11	3-84 8-76
Composition of Solids other than Fat	8-51 11-82	8-04 11-06	3-54 13-16	3-66 8-80
Total Solids	12-38 20-33	12-00 19-11	12-76 26-25	12-52 27-08
Actual weight of Fat, in lbs.	0-93 1-17	0-79 0-715	0-705 0-61	0-985 0-95
Calculation of Points multiply by 20	18-6 23-4	15-8 14-3	14-1 11-2	19-7 19-0
Actual weight of Solids other than Fat, in lbs.	2-43 2-57	2-07 2-12	1-48 1-49	2-25 2-30
Calculation of Points multiply by 4	9-72 10-28	8-28 8-48	5-92 6-02	9-00 9-20
Points—	87-95 61-60	71-20 46-10	40-00 37-50	77-30 57-30
For weight of Milk (lbs.)	...	...	...	...
For weight of Fat (lbs. × 20)	...	...	...	...
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...
Total Points for Milk	180-1	142-6	104-7	161-7
Deductions	...	...	...	...
TOTAL POINTS GAINED FOR MILK	180-1	142-6	104-7	161-7
Points for time since Calving	...	2-2	3-6	...
TOTAL POINTS GAINED	180-1	144-8	108-3	161-7
Points gained for Milk per 1,000 lbs. live weight	121-3	107-4	68-8	127-1
Points for time since Calving	...	2-2	3-6	...
Total Points per 1,000 lbs. live weight	121-3	109-6	72-4	127-1
Remarks and Awards	1st Prize.	3rd Prize.	Highly Commended.	2nd Prize.

CLASS 9.—BRITISH FRIESIAN COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925)—Continued.

Number Name	...	...	...	...	...	142 Deighton Henrietta.	144 Elmscott Ceres May.
Born	...	...	...	...	...	June 5, 1924.	Nov. 20, 1924.
Live weight, in lbs.	...	...	...	...	...	1,435	1,544
Last calving	...	...	...	...	...	Sept. 20,	Sept. 9,
Days since Calving	...	...	...	...	...	33	44
Weight of Milk, 1st day	...	...	...	...	...	Morn. 21.4 Aft. 21.5 Even. 21.7	Morn. 12.7 Aft. 13.0 Even. 13.2
Weight of Milk, 2nd day	...	...	...	...	...	21.4 23.1 23.3	12.8 14.4 13.5
Total	...	...	...	...	...	42.8 44.6 45.0	25.5 28.3 20.7
Average	...	...	...	...	...	21.4 22.3 22.5	12.75 14.15 13.35
Percentage of Fat	...	...	...	...	...	3.10 3.47 2.72	3.62 4.48 3.35
Composition of Milk { Fat	...	...	...	...	...	1.64 1.76 1.50	1.87 2.74 2.20
" Solids other than Fat	...	...	...	...	...	11.96 12.06 11.42	12.48 12.24 12.21
" Total Solids	...	...	...	...	...	13.60 13.82 12.92	14.35 16.22 14.41
Actual weight of Fat, in lbs.	...	...	...	...	...	0.68 0.775 0.61	0.46 0.635 0.445
Calculation of Points multiply by 20	...	...	...	...	...	13.6 15.5 12.2	9.2 12.7 8.0
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	1.85 1.91 1.91	1.12 1.24 1.19
Calculation of Points multiply by 4	...	...	...	...	...	7.40 7.64 7.64	4.48 4.96 4.76
Points—	...	...	...	...	...	66.20 41.30 22.68	40.25 30.80 14.20
For weight of Milk (lbs.)	...	...	...	...	...	...	...
For weight of Fat (lbs. $\times 20$)	...	...	...	...	...	...	...
For weight of Solids other than Fat (lbs. $\times 4$)	...	...	...	...	...	...	...
Total Points for Milk	...	...	...	...	...	130.2	85.3
Deductions	...	...	...	...	...	10.0	...
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	120.2	85.3
Points for time since Calving	...	...	...	...	...	...	0.4
TOTAL POINTS GAINED	...	...	...	...	...	120.2	85.7
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	84.7	63.4
Points for time since Calving	...	...	...	...	...	...	0.4
Total Points per 1,000 lbs. live weight	...	...	...	...	...	84.7	63.8
Remarks and Awards	...	...	...	...	...	Reserve.	...

CLASS 10.—BRITISH FRIESIAN HEIFERS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF).

Number Name ...	147 Land Beauty's Margaret.	149 Glyndebourne Skylark.	150 Glyndebourne Elva 3rd.	151 Hannah's Froukje's Brecht.
Born ...	Jan. 25, 1926. 1926.	Sept. 14, 1925. 1925.	Feb. 20, 1926. 1926.	Feb. 24, 1926. 1926.
First Calving ...	Aug. 13. 1926.	Sept. 13. 1925.	Aug. 22. 1926.	Aug. 25. 1926.
Days since Calving ...	71	40	62	59
Weight of Milk, 1st day ...	Morn. 13.4 Aft. 12.8 Even. 13.5	Morn. 17.8 Aft. 17.8 Even. 18.8	Morn. 14.2 Aft. 14.0 Even. 12.8	Morn. 12.3 Aft. 14.3 Even. 14.3
Weight of Milk, 2nd day ...	13.9 13.6 13.0	19.1 17.9 18.2	13.9 14.1 13.0	14.0 13.9 13.3
Total ...	27.3	36.9	28.1	26.3
Average ...	13.65	18.45	14.05	13.15
Percentage of Fat ...	3.62	3.13	3.87	2.72
Composition of the Milk. { Solids other than Fat ...	8.66	9.49	9.41	8.13
Total Solids ...	12.28	13.02	13.16	10.86
Actual weight of Fat, in lbs. ...	0.495	0.575	0.69	0.36
Calculation of Points multiply by 20 ...	9.9	11.5	10.2	7.2
Actual weight of Solids other than Fat, in lbs. ...	1.18	1.75	1.26	1.16
Calculation of Points multiply by 4 ...	4.72	7.00	5.04	4.64
For weight of Milk (lbs.) ...	40.10	54.80	41.00	41.05
For weight of Fat (lbs. x 20) ...	27.20	39.10	39.10	32.00
For weight of Solids other than Fat (lbs. x 4) ...	14.08	20.72	15.04	14.60
Total Points for Milk ...	81.4	114.6	88.0	79.9
Deductions ...	—	—	—	10.0
TOTAL POINTS GAINED FOR MILK ...	81.4	114.6	88.0	69.9
Points for time since Calving ...	3.1	—	2.2	1.9
TOTAL POINTS GAINED ...	84.5	114.6	90.2	71.8
Points gained for Milk per 1,000 lbs. live weight ...	62.1	87.4	71.5	62.4
Points for time since Calving ...	3.1	—	2.2	1.9
Total Points per 1,000 lbs. live weight ...	65.2	87.4	73.7	64.3
Remarks and Awards ...	Highly Commended.	2nd Prize.	Reserve.	

CLASS 10.—BRITISH FRIESIAN HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

Number Name ...	153 Hamels Iris.	155 Hamels Helena.	156 Herrington Flora.	157 Herrington Gladys.
Born ...	Jan. 30, 1926. 1,248	Dec. 24, 1925. 1,188	Oct. 6, 1925. 1,353	Feb. 4, 1926. 1,415
Live weight, in lbs. ...	Sept. 17. 36	Sept. 18. 35	Sept. 16. 37	Aug. 22. 62
Last Calved ...				
Days since Calving ...				
Weight of Milk, 1st day ...	Morn. Aft. Even. 14.4 16.3 17.1	Morn. Aft. Even. 12.2 13.2 15.0	Morn. Aft. Even. 18.5 19.7 18.8	Morn. Aft. Even. 18.4 18.1 17.1
Weight of Milk, 2nd day ...	13.3 16.9 16.3	12.6 12.2 13.2	17.7 20.0 19.2	18.6 17.6 17.4
Total ...	27.7 33.2 33.4	24.8 25.4 28.2	36.2 39.7 38.0	37.0 35.7 34.5
Average ...	13.85 16.6 16.7	12.4 12.7 14.1	18.1 19.85 19.0	18.5 17.85 17.25
Percentage of Fat ...	2.68 3.12 3.22	2.61 2.05 3.11	3.12 3.61 3.30	3.27 5.27 2.04
Composition of the Milk. { Solids other than Fat ...	8.92 9.28 8.96	8.81 9.03 8.72	8.56 8.81 8.72	8.27 8.69 8.50
Total Solids ...	11.60 12.40 12.18	11.42 11.06 11.83	11.68 12.42 12.02	11.54 13.06 11.44
Actual weight of Fat, in lbs. ...	0.375 0.515 0.54	0.325 0.375 0.44	0.565 0.715 0.63	0.61 0.94 0.51
Calculation of Points multiply by 20 ...	7.5 10.3 10.8	6.5 7.5 8.8	11.3 14.3 12.6	12.2 18.8 10.2
Actual weight of Solids other than Fat, in lbs. ...	1.24 1.54 1.50	1.00 1.15 1.25	1.55 1.76 1.66	1.53 1.55 1.47
Calculation of Points multiply by 4 ...	4.96 6.16 6.00	4.36 4.60 5.00	6.20 7.04 6.64	6.12 6.20 5.88
Points—For weight of Milk (lbs.) ...	47.15	39.20	56.95	53.60
For weight of Fat (lbs. $\times 20$) ...	28.60	22.80	38.20	41.20
For weight of Solids other than Fat (lbs. $\times 4$) ...	17.12	13.96	19.88	18.20
Total Points for Milk ...	92.9	76.0	115.0	113.0
Deductions ...	10.0	20.0	—	20.0
TOTAL POINTS GAINED FOR MILK ...	82.9	56.0	115.0	93.0
Points for time since Calving ...	—	—	—	2.2
TOTAL POINTS GAINED ...	82.9	56.0	115.0	95.2
Points gained for Milk per 1,000 lbs. live weight ...	66.3	47.1	85.0	65.7
Points for time since Calving ...	—	—	—	2.2
Total Points per 1,000 lbs. live weight ...	66.3	47.1	85.0	67.9
Remarks and Awards ...	Highly Commended.		1st Prize.	3rd Prize.

CLASS 11.—SOUTH DEVON COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK OF THE SOUTH DEVON HERD BOOK SOCIETY).

Number Name ...	...	...	...	...	...	160 Buryke Negress.		161 Milkmaid 14th.		163 Rowden Lovely.	
						Oct. 23, 1925. 1,344 Sept. 3, 50	...	Sept. 5, 1919. 1,658 Sept. 22, 31	...	Feb. 5, 1925. 1,617 Aug. 6, 78	...
Born ...	...	...	...	...	...	Morn. Aft. Even.	...	Morn. Aft. Even.	...	Morn. Aft. Even.	...
Live weight, in lbs. ...	...	...	...	...	...	12-9 14-3 13-3	...	24-8 25-6 20-2	...	13-3 15-2 14-8	...
Last Calved ...	...	...	...	...	...	13-5 13-5 12-1	...	28-1 25-0 22-2	...	14-9 15-1 14-0	...
Days since Calving ...	...	...	...	...	...	20-4 27-8 25-4	...	52-9 50-0 42-4	...	28-2 30-3 28-8	...
Weight of Milk, 1st day ...	...	...	...	...	...	13-2 13-9 12-7	...	20-45 25-3 21-2	...	14-1 15-15 14-4	...
Weight of Milk, 2nd day ...	...	...	...	...	...	3-13 3-55 3-57	...	4-23 4-92 3-07	...	3-20 3-97 4-07	...
Total ...	...	...	...	...	...	9-05 9-13 9-03	...	8-61 8-58 8-07	...	9-06 9-01 9-25	...
Average ...	...	...	...	...	...	12-18 12-68 12-00	...	12-84 13-50 11-74	...	12-26 12-98 13-32	...
Percentage { Fat Composition of Solids other than Fat ...	...	...	...	...	...	0-415 0-485 0-455	...	1-12 1-25 0-65	...	0-45 0-605 0-585	...
Actual weight of Fat, in lbs. ...	...	...	...	...	...	8-3 9-9 9-1	...	22-4 25-0 13-0	...	9-0 12-10 11-70	...
Calculation of Points multiply by 20 ...	...	...	...	...	...	1-19 1-27 1-15	...	2-28 2-18 1-84	...	1-28 1-37 1-34	...
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	4-76 5-08 4-00	...	9-12 8-72 7-26	...	5-12 5-48 5-3	...
Calculation of Points multiply by 4 ...	...	...	...	...	...	39-80	...	72-95	...	43-65	...
For weight of Milk (lbs.) ...	...	...	...	...	...	27-30	...	60-40	...	32-80	...
For weight of Fat (lbs. x 20) ...	...	...	...	...	...	14-44	...	25-20	...	15-96	...
For weight of Solids other than Fat (lbs. x 4) ...	...	...	...	...	...	81-5	...	158-6	...	92-4	...
Total Points for Milk ...	...	...	...	...	...	...	...	...	...	...	...
Deductions ...	...	...	...	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	...	81-5	...	158-6	...	92-4	...
Points for time since Calving ...	...	...	...	...	...	1-0	...	...	...	3-8	...
TOTAL POINTS GAINED ...	...	...	...	...	...	82-5	...	158-6	...	96-2	...
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	...	60-6	...	95-6	...	56-1	...
Points for time since Calving ...	...	...	...	...	...	1-0	...	...	...	3-8	...
Total Points per 1,000 lbs. live weight ...	...	...	...	...	...	61-6	...	95-6	...	59-9	...
Remarks and Awards ...	...	...	...	...	...	Highly Commended.	...	1st Prize.	...	...	...

CLASS 10.—BRITISH FRIESIAN HELPERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

CLASS 13.—DAIRY SOUTH DEVON COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK OF THE RECORDED DAIRY SOUTH DEVON CATTLE SOCIETY).

Number Name ...	164 Foreman 3rd.	166 Cherry.	167 Warren.	169 Blackpool.
Born ...	1-269 April 27. 170	1-302 Jan 4. 111	1-576 June 29. 116	1-416 Sept. 1. 52
Live weight, in lbs. ...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Last Calved ...	17-6 20-0 19-4	15-6 17-3 14-9	10-4 11-4 10-2	17-7 18-4 16-6
Days since Calving ...	19-2 18-6 19-2	15-4 17-5 17-5	11-5 11-5 11-6	17-7 18-7 18-8
Weight of Milk, 1st day ...	30-8 38-6 38-6	31-0 35-0 32-4	21-9 22-9 21-8	35-4 37-1 35-4
Weight of Milk, 2nd day ...	18-4 19-3 19-3	15-5 17-4 16-2	10-95 11-45 10-9	17-7 18-55 17-7
Total	6-37 6-86 5-75	4-09 4-41 3-82	4-95 5-03 4-51	4-18 5-06 4-12
Average	8-89 8-66 8-59	8-03 8-91 8-75	8-21 8-87 8-75	9-12 9-30 9-24
Percentage { Fat ...	15-26 15-52 14-34	13-02 13-55 12-74	12-06 12-90 13-26	13-30 14-36 13-36
Composition of { Solids other than Fat ...	1-17 1-32 1-11	0-65 0-77 0-62	0-475 0-58 0-495	0-74 0-94 0-73
Total Solids ...	23-4 26-4 22-2	12-6 15-4 12-4	9-5 11-6 9-9	14-8 18-8 14-6
Actual weight of Fat, in lbs. ...	1-64 1-67 1-06	1-38 1-56 1-44	0-955 1-02 0-96	1-62 1-725 1-61
Calculation of Points multiply by 20 ...	6-56 6-68 6-64	5-52 6-24 6-76	3-82 4-08 3-84	6-48 6-90 6-56
Actual weight of Solids other than Fat, in lbs. ...	57-0	49-10	33-30	53-95
Calculation of Points multiply by 4 ...	72-0	40-40	31-00	48-20
Points weight of Milk (lbs.) ...	19-88	17-52	11-74	19-94
For weight of Fat (lbs. x 20) ...	148-9	107-0	70-0	122-1
For weight of Solids other than Fat (lbs. x 4) ...	148-9	107-0	70-0	122-1
Total Points for Milk ...	148-9	107-0	70-0	122-1
Deductions ...	148-9	107-0	70-0	122-1
TOTAL POINTS GAINED FOR MILK ...	148-9	107-0	70-0	122-1
Points for time since Calving ...	12-0	7-1	7-6	1-2
TOTAL POINTS GAINED ...	160-9	114-1	83-6	123-3
Points gained for Milk per 1,000 lbs. live weight ...	106-3	82-3	48-2	86-3
Points for time since Calving ...	12-0	7-1	7-6	1-2
Total Points per 1,000 lbs. live weight ...	118-3	89-4	55-8	87-5
Remarks and Awards ...	1st Prize.	Reserve.		3rd Prize.

CLASS 13.—DAIRY SOUTH DEVON COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK OF THE RECORDED DAIRY SOUTH DEVON CATTLE SOCIETY)—Continued.

Number Name ...	...	...	...	...	...	170 Alice 50th.	171 Wraxall Darding 3rd.	172 Chamington Glitter.	173 Chamington Rebecca 3rd.
Born ...	...	...	...	...	...	June 16, 1921, 1.571	Jan. 25, 1921, 1.482	June 24, 1923, 1.598	Mar. 28, 1925, 1.102
Lave weight, in lbs. ...	...	...	...	...	...	June 20, 125	Feb. 22, 244	April 24, 182	April 23, 183
Last Calved ...	...	...	...	...	...	Morn. Aft. Even. 17.8 19.5 18.3	Morn. Even. 12.9 12.1	Morn. Even. 12.0 12.9	Morn. Even. 12.9 12.3
Days since Calving ...	...	...	...	...	...	19.0 20.3 17.9	10.6 12.0	7.1 5.9	12.9 12.3
Weight of Milk, 1st day ...	...	...	...	...	...	36.8 39.8 36.2	23.5 24.1	14.4 12.5	25.8 25.2
Weight of Milk, 2nd day ...	...	...	...	...	...	18.4 19.9 18.1	11.75 12.05	7.2 6.25	12.9 12.6
Total ...	...	...	...	...	...	4.81 5.77 5.20	5.39 4.85	4.03 4.80	3.84 4.10
Average ...	...	...	...	...	...	9.25 9.31 9.56	9.11 9.41	8.87 8.16	9.38 9.36
Percentage { Fat ...	...	...	...	...	...	14.06 15.08 14.76	14.50 14.26	12.90 12.96	13.22 13.46
Composition of { Solids other than Fat ...	...	...	...	...	...	0.885 1.15 0.94	0.63 0.585	0.29 0.30	0.495 0.52
Milk. { Total Solids ...	...	...	...	...	...	17.9 23.0 18.8	12.6 11.7	5.8 6.0	9.9 10.4
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	1.70 1.86 1.73	1.07 1.14	0.64 0.51	1.21 1.18
Calculation of Points multiply by 4 ...	...	...	...	...	...	6.80 7.44 6.92	4.28 4.50	2.56 2.04	4.84 4.72
Points—	...	...	...	...	...	56.40	23.80	13.45	25.50
For weight of Milk (lbs.) ...	...	...	...	...	...	59.50	24.30	11.80	20.30
For weight of Fat (lbs. × 29) ...	...	...	...	...	...	21.16	8.84	4.60	9.56
For weight of Solids other than Fat (lbs. × 4) ...	...	...	...	...	...	137.1	56.9	29.9	55.4
Total Points for Milk ...	...	...	...	...	...	—	—	10.0	—
Deductions ...	...	...	...	...	...	137.1	56.9	19.9	55.4
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	...	8.5	12.0	12.0	12.0
Points for time since Calving ...	...	...	...	...	...	145.6	68.9	31.9	67.4
TOTAL POINTS GAINED ...	...	...	...	...	...	82.2	38.4	12.4	47.6
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	...	8.5	12.0	12.0	12.0
Points for time since Calving ...	...	...	...	...	...	90.7	50.4	24.4	59.6
Total Points per 1,000 lbs. live weight ...	...	...	...	...	...	2nd Prize.			
Remarks and Awards ...	...	...	...	...	...

CLASS 15.—RED POLL COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR PREVIOUS TO 1ST AUGUST, 1923).

Number Name ...	174 Brettenham Bertha.	177 Manor Bay Trec.	179 Ashmoor Vixen.	181 Saham Darker Draught.
Born ...	Jan. 17, 1922. 1.394	June 24, 1923. 1.108	Aug. 23, 1922. 1.371	Sept. 4, 1922. 1.356
Live weight, in lbs. ...	Aug. 28. 56	Sept. 3. 50	Aug. 3. 81	Sept. 13. 40
Last Calved ...				
Days since Calving ...				
Weight of Milk, 1st day ...	Morn. Even. 33.4 31.8	Morn. Even. 18.5 20.1	Morn. Aft. Even. 16.6 18.2	Morn. Aft. Even. 19.5 20.8
Weight of Milk, 2nd day ...	33.4 32.8	19.1 19.6	18.4 17.8	21.0 19.1
Total ...	64.4 64.6	37.6 39.7	35.0 36.0	40.5 39.9
Average ...	32.2 32.3	18.8 19.85	17.5 18.0	20.25 19.95
Percentage { Fat ...	3.11 3.44	3.66 4.08	2.40 3.31	2.87 4.01
Composition of { Solids other than Fat ...	8.71 8.88	9.32 9.24	8.92 9.11	9.23 9.50
the Milk, { Total Solids ...	11.82 12.32	12.98 13.32	11.32 12.32	12.10 14.50
Actual weight of Fat, in lbs. ...	1.0 1.115	0.69 0.81	0.42 0.59	0.58 0.98
Calculation of Points multiply by 20 ...	20.0 22.3	13.8 16.2	8.4 11.8	11.6 19.6
Actual weight of Solids other than Fat, in lbs. ...	2.81 2.86	1.76 1.84	1.56 1.61	1.88 1.85
Calculation of Points multiply by 4 ...	11.24 11.44	7.04 7.36	6.24 6.56	7.52 7.40
Points—				
For weight of Milk (lbs.) ...	64.50	38.65	53.35	61.90
For weight of Fat (lbs. × 20) ...	42.30	30.00	32.20	51.60
For weight of Solids other than Fat (lbs. × 4) ...	22.68	14.40	19.44	23.36
Total Points for Milk ...	129.5	83.1	105.0	136.9
Deductions ...	—	—	10.0	10.0
TOTAL POINTS GAINED FOR MILK ...	129.5	83.1	95.0	126.9
Points for time since Calving ...	1.6	1.0	4.1	—
TOTAL POINTS GAINED ...	131.1	84.1	99.1	136.9
Points gained for Milk per 1,000 lbs. live weight ...	97.0	75.0	69.3	93.6
Points for time since Calving ...	1.6	1.0	4.1	—
Total Points per 1,000 lbs. live weight ...	98.6	76.0	73.4	93.6
Remarks and Awards ...	1st Prize.			2nd Prize.

CLASS 15.—RED POLL COWS (BORN ON OR PREVIOUS TO 1ST AUGUST, 1923)—(Continued).

Number Name ... ..	...	...	...	...	182 Longford Symphony.	187 Seven Springs Quinine.	188 Knepp Beryl 3rd.	189 Shofford Star Duchess 172nd.
Born ... ..	...	...	...	...	April 21, 1923. 1,302	Oct. 12, 1923. 1,336	Oct. 10, 1923. 1,300	Dec. 17, 1923. 1,199
Live weight, in lbs. ... ..	...	...	...	...	April 26. 180	Sept. 22. 31	Sept. 26. 27	Sept. 10. 43
Last Calved ... ..	...	...	...	...	...	...	...	...
Days since Calving ... ..	...	...	...	...	...	...	...	...
Weight of Milk, 1st day ... ..	...	...	...	...	Morn.	Morn.	Morn.	Morn.
Weight of Milk, 2nd day ... ..	...	...	...	...	Aft.	Aft.	Aft.	Aft.
Total ... ..	...	...	...	...	Even.	Even.	Even.	Even.
Average ... ..	...	...	...	...	...	...	...	...
Percentage of Fat ... ..	...	...	...	...	...	...	...	...
Composition of { Solids other than Fat ... ..	...	...	...	...	...	...	...	...
the Milk. { Total Solids ... ..	...	...	...	...	...	...	...	...
Actual weight of Fat, in lbs. ... ..	...	...	...	...	...	...	...	...
Calculation of Points multiply by 20 ... ..	...	...	...	...	...	...	...	...
Actual weight of Solids other than Fat, in lbs. ... ..	...	...	...	...	...	...	...	...
Calculation of Points multiply by 4 ... ..	...	...	...	...	...	...	...	...
For weight of Milk (lbs. $\times 20$) ... ..	...	...	...	...	...	...	...	...
For weight of Fat (lbs. $\times 20$) ... ..	...	...	...	...	...	...	...	...
For weight of Solids other than Fat (lbs. $\times 4$) ... ..	...	...	...	...	...	...	...	...
Total Points for Milk ... ..	...	...	...	...	...	...	...	...
Deductions ... ..	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED FOR MILK ... ..	...	...	...	...	...	...	...	...
Points for time since Calving ... ..	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED ... ..	...	...	...	...	...	...	...	...
Points gained for Milk per 1,000 lbs. live weight ... ..	...	...	...	...	...	...	...	...
Points for time since Calving ... ..	...	...	...	...	...	...	...	...
Total Points per 1,000 lbs. live weight ... ..	...	...	...	...	...	...	...	...
Remarks and Awards ... ..	...	...	...	...	...	...	...	...

Highly Commended.

CLASS 16.—RED POLL COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925).—Continued.

Number Name	191 Longford Picotette.	192 Upton Rose Queen.	193 Upton Minnow.	194 Saham Damaris.
Born	Aug. 26, 1923. 1,296.	Aug. 28, 1924. 1,067.	Jan. 7, 1925. 1,320.	Nov. 19, 1923. 1,406.
Live weight, in lbs.	Aug. 13. 71	Aug. 12. 72	Sept. 27. 26	Oct. 6. 17
Last Calved				
Days since Calving				
Weight of Milk, 1st day	Morn. Aft. Even. 23.8 23.0 19.6	Morn. Aft. Even. 18.7 18.7 15.6	Morn. Aft. Even. 17.3 17.3 16.5	Morn. Aft. Even. 14.9 20.6 19.4
Weight of Milk, 2nd day	21.0 22.5 21.9	10.1 18.8 17.2	17.6 19.2 17.7	19.3 18.7 19.6
Total	44.8 45.5 41.5	34.8 37.5 32.8	34.9 36.5 34.2	34.2 39.3 39.0
Average	22.4 22.75 20.75	17.4 18.75 16.4	17.45 18.25 17.1	17.1 19.65 19.5
Percentage of Fat	3.84 3.81 4.03	4.29 5.76 4.75	4.37 4.63 5.88	3.37 3.71 3.86
Composition of Milk. { Solids other than Fat	8.66 9.95 9.23	8.55 8.44 8.51	9.27 8.61 8.64	0.03 0.17 0.24
the Milk. { Total Solids	12.50 13.76 13.26	12.84 14.20 13.26	13.84 13.24 14.32	12.40 12.92 13.10
Actual weight of Fat, in lbs.	0.86 0.865 0.84	0.745 1.08 0.78	0.8 0.85 1.00	0.375 0.75 0.75
Calculation of Points multiply by 20	17.2 17.3 16.8	14.9 21.6 15.6	16.0 17.0 20.0	11.5 14.6 15.0
Actual weight of Solids other than Fat, in lbs.	1.95 2.26 1.92	1.49 1.58 1.40	1.62 1.57 1.48	1.54 1.81 1.80
Calculation of Points multiply by 4	7.80 9.04 7.68	5.96 6.32 5.60	6.48 6.28 5.92	6.16 7.24 7.20
For weight of Milk (lbs.)	65.00	52.55	52.80	56.25
For weight of Fat (lbs. × 20)	51.30	52.10	53.00	41.10
For weight of Solids other than Fat (lbs. × 4)	24.52	17.88	18.68	20.60
Total Points for Milk	141.7	125.5	124.48	118.0
Deductions	—	10.0	—	—
TOTAL POINTS GAINED FOR MILK	141.7	115.5	124.48	118.0
Points for time since Calving	3.1	3.2	—	—
TOTAL POINTS GAINED	144.8	118.7	124.48	118.0
Points gained for Milk per 1,000 lbs. live weight	109.1	105.5	94.0	84.0
Points for time since Calving	3.1	3.2	—	—
Total Points per 1,000 lbs. live weight	112.2	108.7	94.0	84.0
Remarks and Awards	2nd Prize.	Highly Commended.	Highly Commended.	Highly Commended.

CLASS 16.—RED POLL COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925).—Continued.

Number Name	195 Upton Sally.	196 Itanley Ideal.	197 Basldon Russett.	198 Kettledurgh Rosie 28th.
Born	Feb. 9, 1924. 1,412	Jan. 22, 1924. 1,235	Sept. 9, 1923. 1,079	Feb. 12, 1924. 1,114
Live weight, in lbs.	July 5. 116	Aug. 19. 65	Aug. 11. 73	Aug. 30. 54
Last Calved	...	...	...	...
Days since Calving	...	...	...	...
Weight of Milk, 1st day	Morn. Aff. Even. 15.6 16.9 15.0	Morn. Aff. Even. 13.8 11.4 9.3	Morn. Aff. Even. 23.3 20.0 22.3	Morn. Aff. Even. 22.7 20.0 21.5
Weight of Milk, 2nd day	14.0 14.7 15.1	12.4 11.4 11.8	20.7 19.8 20.9	19.7 18.1 22.1
Total	20.6 31.6 31.0	26.2 22.8 21.1	44.0 39.8 43.2	42.4 38.1 43.6
Average	14.8 15.8 15.5	13.1 11.4 10.55	22.0 19.9 21.6	21.2 19.05 21.8
Percentage { Fat Composition of { Solids other than Fat the Milk. { Total Solids	2.70 4.75 4.02 8.80 9.01 8.74 11.50 13.76 12.76	4.07 4.77 4.21 9.15 9.17 9.13 13.82 13.94 13.34	3.87 4.40 4.20 8.83 9.10 9.01 12.70 13.50 13.30	3.16 4.37 4.02 8.50 8.79 8.82 11.06 13.16 12.81
Actual weight of Fat, in lbs.	0.4 0.75 0.625	0.615 0.545 0.445	0.835 0.88 0.93	0.67 0.83 0.875
Calculation of Points multiply by 20	8.0 15.0 12.5	12.3 10.9 8.9	17.1 17.6 18.6	13.4 16.6 17.5
Actual weight of Solids other than Fat, in lbs.	1.31 1.42 1.36	1.20 1.04 0.97	1.05 1.81 1.94	1.80 1.67 1.43
Calculation of Points multiply by 4	5.24 5.68 5.44	4.80 4.16 3.88	7.8 7.24 7.76	7.2 6.68 7.72
For weight of Milk (lbs.)	46.10	35.05	63.50	62.05
For weight of Fat (lbs. × 20)	35.50	32.10	53.30	47.50
For weight of Solids other than Fat (lbs. × 4)	16.36	12.84	22.80	21.60
Total Points for Milk	98.0	80.0	130.6	131.2
Deductions	10.0	—	—	—
TOTAL POINTS GAINED FOR MILK	88.0	80.0	130.6	131.2
Points for time since Calving	7.0	2.5	3.3	1.4
TOTAL POINTS GAINED	95.0	82.5	142.9	132.6
Points gained for Milk per 1,000 lbs. live weight	62.2	64.7	120.2	117.6
Points for time since Calving	7.0	2.5	3.3	1.4
Total Points per 1,000 lbs. live weight	69.2	67.2	132.5	119.0
Remarks and Awards	Highly Commended.		3rd Prize.	Highly Commended.

CLASS 16.—RED POLL COWS (BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925)—Continued.

Number Name	...	...	...	...	...	200 Lydiat Daisy.	202 Henham Philippa.
Born	...	...	...	...	...	Sept. 12, 1924.	Mar. 5, 1924.
Live weight, in lbs.	...	...	...	...	...	1,186	1,282
Last Calved	...	...	...	...	...	Sept. 5,	Oct. 6,
Days since Calving	...	...	...	...	...	48	17
Weight of Milk, 1st day	...	...	...	...	...	Morn.	Morn.
Weight of Milk, 2nd day	...	...	...	...	...	16.5	10.2
	...	...	...	...	...	18.3	16.8
	...	...	...	...	...	18.7	28.3
	...	...	...	...	...	15.8	30.3
	...	...	...	...	...	32.6	29.7
Total	...	...	...	...	...	34.8	58.6
Average	...	...	...	...	...	17.4	58.0
Percentage { Fat	...	...	...	...	...	17.4	29.3
Composition of { Solids other than Fat	...	...	...	...	...	3.17	3.01
the Milk { Total Solids	...	...	...	...	...	8.91	3.39
Actual weight of Fat, in lbs.	...	...	...	...	...	9.11	3.00
	...	...	...	...	...	12.82	9.37
	...	...	...	...	...	13.44	8.94
	...	...	...	...	...	0.68	12.76
	...	...	...	...	...	0.605	12.54
	...	...	...	...	...	0.64	0.995
Calculation of Points multiply by 20	...	...	...	...	...	13.6	1.045
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	12.1	10.9
	...	...	...	...	...	12.8	20.9
Calculation of Points multiply by 4	...	...	...	...	...	1.56	2.75
	...	...	...	...	...	1.64	2.90
Points—	...	...	...	...	...	6.24	11.0
For weight of Milk (lbs.) ...	...	...	...	...	...	6.56	10.4
For weight of Fat (lbs. × 20) ...	...	...	...	...	...	51.15	58.80
For weight of Solids other than Fat (lbs. × 4) ...	...	...	...	...	...	38.50	40.80
	...	...	...	...	...	19.04	21.40
Total Points for Milk	...	...	...	...	...	108.7	120.5
Deductions	...	...	...	...	...	—	—
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	108.7	120.5
Points for time since Calving	...	...	...	...	...	0.8	—
TOTAL POINTS GAINED	...	...	...	...	...	109.5	120.5
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	91.7	97.8
Points for time since Calving	...	...	...	...	...	0.8	—
Total Points per 1,000 lbs. live weight	...	...	...	...	...	92.5	97.8
Remarks and Awards	...	...	...	...	...	Highly Commended.	Highly Commended.

CLASS 17.—RED POLL HEIFERS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK, BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF.)

Number Name ..	207 Shottford Star Duchess 1918.	210 Marsden Meyvis.	211 Basildon Rosalind 3rd.	213 Basildon Royal Rosie 5th.
Born ..	Sept. 6, 1925. 1-136 July 18. 97	Jan. 17, 1926. 1-050 Sept. 3b. 23	Oct. 23, 1925. 1-110 June 27. 118	Feb. 12, 1926. 1-236 Sept. 8. 45
Live weight, in lbs. ...	...	...	...	...
Last Calved ...	...	...	...	...
Days since Calving ...	...	...	...	...
Weight of Milk, 1st day ...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Weight of Milk, 2nd day ...	13-1 13-0 13-2 13-7 13-7 12-9	14-4 13-5 14-0 13-9 14-1 14-5	19-5 17-6 18-6 18-0 17-1 18-4	17-3 16-6 16-9 16-6 16-0 15-8
Total ...	26-8 26-7 26-1	28-3 27-6 28-5	37-5 34-7 37-0	33-9 32-6 32-7
Average ...	13-4 13-35 13-05	14-15 13-8 14-25	18-75 17-35 18-5	16-95 16-3 16-35
Percentage { Fat ...	4-32 3-71 3-80 8-60 9-23 9-30	4-50 4-70 4-78 9-11 9-28 9-94	3-74 3-96 4-03 8-66 8-24 9-23	3-64 4-70 4-49 12-38 13-58 13-60
Composition of { Solids other than Fat ...	12-92 12-94 13-10 0-58 0-5 0-465	13-70 13-98 14-72 0-65 0-65 0-68	12-40 13-20 13-53 0-7 0-60 0-745	12-38 13-58 13-60 0-62 0-77 0-73
Actual weight of Fat, in lbs. ...	...	...	...	...
Calculation of Points multiply by 20 ...	11-6 10-0 9-9	13-0 13-0 13-6	14-0 13-8 14-9	12-4 13-4 14-6
Actual weight of Solids other than Fat, in lbs. ...	1-16 1-23 1-22	1-29 1-28 1-42	1-02 1-00 1-71	1-48 1-45 1-485
Calculation of Points multiply by 4 ...	4-64 4-92 4-88	5-16 5-12 5-68	6-48 6-40 6-84	5-92 5-80 5-94
Points—	...	...	...	...
For weight of Milk (lbs.) ...	39-80 31-50	42-20 39-60	54-60 42-70	49-60 42-40
For weight of Fat (lbs. × 20) ...	14-44	15-96	19-72	17-66
For weight of Solids other than Fat (lbs. × 4) ...	...	...	...	...
Total Points for Milk ...	85-7	97-8	117-0	100-7
Deductions ...	—	—	—	—
TOTAL POINTS GAINED FOR MILK ...	85-7	97-8	117-0	100-7
Points for time since Calving ...	5-7	—	7-8	0-5
TOTAL POINTS GAINED ...	91-4	97-8	124-8	110-2
Points gained for Milk per 1,000 lbs. live weight ...	75-5 5-7	92-2	103-0 7-8	87-2 0-5
Points for time since Calving ...	...	...	...	...
Total Points per 1,000 lbs. live weight ...	81-2	92-2	110-8	87-7
Remarks and Awards ...	Reserve.	3rd Prize.	1st Prize.	2nd Prize.

CLASS 17.—RED POLL HEIFERS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR AFTER 1ST AUGUST, 1925)—*Continued.*

Number Name ...	...	...	...	...	...	214 Lydiat Jannett.	CLASS 18.—BLUE ALBION COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK).			
							215 Seagry Alice.	219 Rowsley Flame.		
Born ...	...	...	...	...	...	Mar. 9, 1926.	Unknown.	Dec. 1, 1922.		
Live weight, in lbs. ...	...	...	...	...	...	1,136	1,350	1,122		
Last Calved ...	...	...	...	...	...	Sept. 6,	Aug. 16,	Sept. 2,		
Days since Calving ...	...	...	...	...	...	47	68	51		
Weight of Milk, 1st day ...	...	...	...	...	...	Morn. 7-3	Morn. 53-6	Morn. 12-7		
Weight of Milk, 2nd day ...	...	...	...	...	...	Aft. 7-3	Even. 31-3	Even. 18-4		
Total ...	...	...	...	...	...	7-2	55-0	16-3		
Average ...	...	...	...	...	...	14-6	64-9	29-0		
Percentage { Fat ...	...	...	...	...	...	7-3	32-45	14-5		
Composition of { Solids other than Fat ...	...	...	...	...	...	7-25	34-05	18-5		
the Milk. { Total Solids ...	...	...	...	...	...	4-19	2-58	2-35		
Actual weight of Fat, in lbs. ...	...	...	...	...	...	0-20	3-76	2-35		
Calculation of Points multiply by 20 ...	...	...	...	...	...	8-07	9-36	9-31		
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	13-52	11-94	11-66		
Calculation of Points multiply by 4 ...	...	...	...	...	...	0-31	0-84	0-34		
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	6-10	16-8	6-8		
Calculation of Points multiply by 4 ...	...	...	...	...	...	0-655	3-05	1-35		
Points ...	...	...	...	...	...	2-62	12-2	5-40		
For weight of Milk (lbs.) ...	...	...	...	...	...	21-85	66-50	23-0		
For weight of Fat (lbs.) ...	...	...	...	...	...	18-20	42-40	16-90		
For weight of Solids other than Fat (lbs. $\times 4$) ...	...	...	...	...	...	8-14	24-24	12-36		
Total Points for Milk ...	...	...	...	...	...	48-5	133-1	62-3		
Deductions ...	...	...	...	...	...	—	10-0	20-0		
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	...	48-5	123-2	42-3		
Points for time since Calving ...	...	...	...	...	...	0-7	2-8	1-1		
TOTAL POINTS GAINED ...	...	...	...	...	...	49-2	125-9	43-4		
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	...	42-7	91-4	37-6		
Points for time since Calving ...	...	...	...	...	...	0-7	2-8	1-1		
Total Points per 1,000 lbs. live weight ...	...	...	...	...	...	43-4	94-2	38-7		
Remarks and Awards ...	...	...	...	...	...		1st Prize.			

CLASS 19.—BLUE ALBION HEIFERS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF).

Number	Name	...	...	...	...	...
320	Wadhams Blue Bell 2nd.	...	...	...	...	...
Born
Live weight, in lbs.
Last calving
Days since Calving
Weight of Milk, 1st day
Weight of Milk, 2nd day
Total
Average
Percentage { Fat
Composition of Solids other than Fat
Milk. Total Solids
Actual weight of Fat, in lbs.
Calculation of Points multiply by 20
Actual weight of Solids other than Fat, in lbs.
Calculation of Points multiply by 4
Points—
For weight of Milk (lbs.)
For weight of Fat (lbs. x 20)
For weight of Solids other than Fat (lbs. x 4)
Total Points for Milk
Deductions
TOTAL POINTS GAINED FOR MILK
Points for time since Calving
TOTAL POINTS GAINED
Points gained for Milk per 1,000 lbs. live weight
Points for time since Calving
Total Points per 1,000 lbs. live weight
Remarks and Awards
1st Prize.

CLASS 21.—AYRSHIRE COWS (ENTERED WITH A NUMBER IN THE HERD BOOK OR IN THE APPENDICES).

Number Name ...	225 Harleyholm Jenny 3rd.	230 Auchenbram Buntie 40th.	231 Auchenbram Madge 18th.	232 Byreholm Buntie.
Born ...	May 21, 1921. 1,414 Sept. 28. 25	Feb. 24, 1921. 1,274 Sept. 27. 26	Jan. 4, 1925. 1,422 Sept. 11. 32	Dec. 10, 1920. 1,105 Sept. 18. 35
Live weight, in lbs. ...	Morn. 28.8 Aft. 30.9 Even. 30.4	Morn. 19.2 Aft. 19.5 Even. 20.7	Morn. 18.0 Aft. 21.2 Even. 19.1	Morn. 20.8 Aft. 21.2 Even. 21.2
Last Calved ...	27.2	20.3	18.0	22.6
Days since Calving ...	53.0	39.5	36.9	43.4
Weight of milk, 1st day ...	60.6	39.1	40.8	41.3
Weight of Milk, 2nd day ...	59.4	41.8	40.0	41.7
Total	26.5	19.75	18.45	21.7
Average	30.3	19.55	20.9	20.85
Percentage of Fat	2.78	4.08	3.61	4.44
Composition of Milk, { Fat 0.26 Solids other than Fat 0.38 Total Solids 1.04	6.00 11.78 17.78	0.26 1.08 1.34	0.26 1.34 1.60	0.26 1.34 1.60
Actual weight of Fat, in lbs. ...	0.74	0.42	0.07	0.97
Calculation of Points multiply by 20 ...	14.8	16.2	13.4	19.4
Actual weight of Solids other than Fat, in lbs. ...	2.39	1.83	1.65	1.92
Calculation of Points multiply by 4 ...	9.56	7.32	6.60	7.68
Points—	86.5	60.2	58.85	63.2
For weight of Milk (lbs.) ...	58.0	54.2	40.50	53.20
For weight of Fat (lbs. × 20) ...	31.44	22.48	21.22	22.88
For weight of Solids other than Fat (lbs. × 4) ...	175.9	136.9	120.6	139.3
Total Points for Milk ...	10.0	—	—	—
Deductions ...	165.9	136.9	120.6	139.3
TOTAL POINTS GAINED FOR MILK	—	—	—	—
Points for time since Calving ...	165.9	136.9	120.6	139.3
TOTAL POINTS GAINED	117.3	107.2	105.2	126.0
Points gained for Milk per 1,000 lbs. live weight ...	—	—	—	—
Points for time since Calving ...	117.3	107.2	105.2	126.0
Total Points per 1,000 lbs. live weight	117.3	107.2	105.4	126.0
Remarks and Awards ...	2nd Prize.	Highly Commended.	Highly Commended.	Highly Commended.

CLASS 21.—AYRSHIRE COWS—Continued.

Number Name	233 Dalgig Heather Bell.	235 Lochlands Lucetta.	236 Meikle Knox Winnie 3rd.	237 Meikle Knox Miss Sally 3rd.
Born	April 7, 1923. 1,292	April 16, 1922. 1,294	April 26, 1924. 1,205	Jan. 19, 1924. 1,348
Live weight, in lbs.	20-3	18-0	18-3	14-5
Last Calved	Oct. 7. 16	Aug. 20. 64	Sept. 30. 23	June 20. 125
Days since Calving	...	...	...	...
Weight of Milk, 1st day	Morn. 20-3 Aft. 21-7 Even. 23-9	Morn. 18-0 Aft. 18-6 Even. 18-3	Morn. 18-3 Aft. 17-9 Even. 17-3	Morn. 14-5 Aft. 15-8 Even. 14-8
Weight of Milk, 2nd day	24-4	22-6	24-1	13-1
Total	44-7	44-3	48-0	28-5
Average	22-35	22-15	24-0	14-25
Percentage	4-01	4-26	3-90	4-33
Composition of	9-23	9-34	9-44	5-30
the Milk.	13-84	13-60	13-34	0-82
Actual weight of Fat, in lbs.	1-03	0-94	0-94	0-63
Calculation of Points multiply by 20	20-6	19-8	18-8	12-6
Actual weight of Solids other than Fat, in lbs.	2-07	2-06	2-26	1-37
Calculation of Points multiply by 4	8-28	8-24	9-04	5-48
Points	68-50	68-50	68-50	42-8
For weight of Milk (lbs.)	58-20	58-20	58-20	42-8
For weight of Fat (lbs. × 20)	23-56	23-56	23-56	16-6
For weight of Solids other than Fat (lbs. × 4)	152-3	152-3	152-3	102-2
Total Points for Milk	152-3	152-3	152-3	102-2
Deductions	...	...	...	...
TOTAL POINTS GAINED FOR MILK	152-3	152-3	152-3	102-2
Points for time since Calving	...	...	...	...
TOTAL POINTS GAINED	152-3	152-3	152-3	110-7
Points gained for Milk per 1,000 lbs. live weight	123-5	123-5	123-5	75-8
Points for time since Calving	...	...	...	...
Total Points per 1,000 lbs. live weight	123-5	123-5	123-5	84-3
Remarks and Awards	Reserve.	Highly Commended.	Highly Commended.	Highly Commended.

Class 21.—AYRSHIRE COWS—Continued.

Number Name ...	238 Mains of Aires Letta.	239 Palmerston Lady Jean 4th.	240 Parton Jean 2nd.	243 Atkenbar Whinnie.
Born ...	Dec., 1922. 1,169	Mar. 13, 1920. 1,287	Oct., 1920. 1,295	Aug. 12, 1920. 1,253
Live weight, in lbs. ...	Oct. 1. 22	Sept. 18. 35	Sept. 16. 37	Sept. 17. 36
Last Calved ...				
Days since Calving ...				
Weight of Milk, 1st day ...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Weight of Milk, 2nd day ...	22-9 22-9 16-5	23-7 22-8 25-1	23-8 21-5 21-5	21-4 22-3 20-3
	18-5 18-6 20-4	24-4 22-8 21-9	21-5 23-2 21-2	20-8 21-8 18-6
Total ...	41-4 41-5 36-9	48-1 45-6 47-0	45-3 46-9 42-7	41-9 44-1 38-9
Average ...	20-9 20-75 18-45	24-05 22-8 23-5	22-65 23-45 21-35	20-95 22-05 19-45
Percentage of Fat ...	3-54 4-00 3-46	4-00 3-01 4-06	3-72 4-11 2-73	3-96 4-99 4-42
Composition of Milk ...	8-80 9-02 9-26	9-22 9-53 9-58	9-16 9-27 9-11	8-98 8-99 9-08
Total Solids ...	12-44 13-02 12-72	13-44 13-44 13-64	12-88 13-38 11-84	12-94 13-98 13-50
Actual weight of Fat, in lbs. ...	0-73 0-83 0-64	0-96 0-89 0-955	0-84 0-96 0-58	0-83 1-10 0-86
Calculation of Points multiply by 20 ...	14-6 10-6 12-8	19-2 17-8 19-1	19-8 19-2 11-6	16-6 22-0 17-2
Actual weight of Solids other than Fat, in lbs. ...	1-84 1-87 1-71	2-23 2-17 2-25	2-07 2-18 1-95	1-88 1-98 1-76
Calculation of Points multiply by 4 ...	7-36 7-48 6-84	8-92 8-68 9-00	8-28 8-72 7-8	7-52 7-92 7-04
Points—				
For weight of Milk (lbs.) ...	39-0	70-35	67-45	62-45
For weight of Fat (lbs. x 20) ...	44-0	56-10	47-60	55-8
For weight of Solids other than Fat (lbs. x 4) ...	21-68	26-60	24-80	22-48
Total Points for Milk ...	125-6	153-1	139-9	140-7
Deductions ...	—	—	10-0	—
TOTAL POINTS GAINED FOR MILK ...	125-6	153-1	129-9	140-7
Points for time since Calving ...	—	—	—	—
TOTAL POINTS GAINED ...	125-6	153-1	129-9	140-7
Points gained for Milk per 1,000 lbs. live weight ...	107-4	119-0	100-3	112-1
Points for time since Calving ...	—	—	—	—
Total Points per 1,000 lbs. live weight ...	107-4	119-0	100-3	112-1
Remarks and Awards ...	Highly Commended.	3rd Prize.	Highly Commended.	Highly Commended.

CLASS 21.—AYRSHIRE COWS—Continued.

Number Name ...	...	...	...	...	...	244 Bargower Eva. May 6, 1921. 1,280 Sept. 30. 23	245 Beuchan Chloe 3rd. Jan. 7, 1921. 1,216 Sept. 6. 47	246 Eginton Mains Blossom. Oct. 2, 1919. 1,220 Sept. 26. 27
Born ...	...	...	...	...	...	Morn. Aft. Even. 20-8 26-0 28-3	Morn. Aft. Even. 23-1 29-0 30-8	Morn. Even. 20-2 31-1
Live weight, in lbs. ...	...	...	...	...	...	20-9 27-0 29-2	22-6 24-2 23-5	28-5 31-3
Last Calved ...	...	...	...	...	...	...	...	...
Days since Calving ...	...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	...	53-7 53-6 55-5	45-7 47-8 44-3	57-7 62-4
Weight of Milk, 2nd day	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	26-85 26-8 27-75	22-85 23-9 22-15	28-85 31-2
Average	...	...	...	...	...	3-94 4-38 3-80	3-17 4-31 3-57	4-52 4-08
Percentage { Fat	...	...	...	...	...	8-52 8-86 9-06	8-79 8-55 9-13	9-12 8-90
Composition of { Solids other than Fat	...	...	...	...	...	12-46 13-24 12-92	11-06 12-86 12-70	13-64 13-94
the Milk. { Total Solids	...	...	...	...	...	1-06 1-18 1-07	0-725 1-03 0-795	1-29 1-56
Actual weight of Fat, in lbs.	...	...	...	...	...	21-2 23-6 21-4	14-5 20-6 15-9	25-8 31-2
Calculation of Points multiply by 20	...	...	...	...	...	2-28 2-38 2-51	2-03 2-05 2-03	2-62 2-80
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	9-12 9-52 10-04	8-12 8-20 8-12	10-48 11-20
Calculation of Points multiply by 4	...	...	...	...	...	81-4	68-9	60-05
Points— For weight of Milk (lbs.) ...	...	...	...	...	...	66-2	51-0	57-0
For weight of Fat (lbs. × 20)	...	...	...	...	...	28-68	24-44	21-68
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...	...	176-3	144-3	138-7
Total Points for Milk	...	...	...	...	...	---	---	---
Deductions	...	...	...	...	...	176-3	144-3	138-7
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	---	---	---
Points for time since Calving	...	...	...	...	...	---	0-7	---
TOTAL POINTS GAINED	...	...	...	...	...	176-3	145-0	138-7
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	137-7	118-8	113-6
Points for time since Calving	...	...	...	...	...	---	0-7	---
Total Points per 1,000 lbs. live weight	...	...	...	...	...	137-7	119-5	113-6
Remarks and Awards	...	...	...	...	...	1st Prize.	Highly Commended.	Highly Commended.

CLASS 22.—AYRSHIRE HEIFERS (REGISTERED OR ELIGIBLE FOR REGISTRATION WITH A NUMBER IN THE HERD BOOK OR IN THE APPENDICES, BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF).

Number Name ...	...	...	...	...	...	247 Salairie Princess.	248 Garrington Rosie 3rd.	249 Garrington Violet 1st.	252 Auchenbrair Yellow Kate 38th.
Born ...	...	...	...	...	...	Jan. 1, 1926. 1,107	Oct. 6, 1925. 1,114 Oct. 8, 15	Jan. 12, 1926. 1,139 Sept. 30, 23	Oct. 27, 1925. 1,001 Sept. 7, 46
Live weight, in lbs. ...	...	...	...	...	...	Even. 14-0	Morn. 16-5 Aft. 17-1 Even. 15-7	Morn. 15-1 Aft. 16-2 Even. 16-0	Morn. 17-3 Aft. 15-5 Even. 15-2
Last Calved ...	...	...	...	...	...	Aug. 22, 62	14-8	15-0	18-1
Days since Calving ...	...	...	...	...	...	28-0	31-3	30-1	35-4
Weight of Milk, 1st day ...	...	...	...	...	...	14-0	15-65	15-05	17-7
Weight of Milk, 2nd day ...	...	...	...	...	...	13-02	13-88	12-28	12-40
Total	...	...	...	...	...	0-525	0-74	0-455	0-595
Average	...	...	...	...	...	10-5	13-6	9-1	11-9
Percentage { Fat	...	...	...	...	...	1-30	1-48	1-39	1-60
Composition of { Solids other than Fat	...	...	...	...	...	5-20	5-92	5-56	6-40
the Milk. { Total Solids	...	...	...	...	...	27-95	47-65	46-2	50-85
Actual weight of Fat, in lbs.	...	...	...	...	...	22-9	44-20	30-7	38-70
Calculation of Points multiply by 20	...	...	...	...	...	9-12	17-92	17-40	18-60
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	61-0	109-8	94-3	103-2
Calculation of Points multiply by 4	...	...	...	...	...	61-0	109-8	94-3	103-2
Points—	...	...	...	...	...	2-2	—	—	0-6
For weight of Milk (lbs.) ...	...	...	...	...	...	63-2	109-8	94-3	103-75
For weight of Fat (lbs. × 20)	...	...	...	...	...	55-1	98-3	82-8	103-0
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...	...	2-2	—	—	0-6
Total Points for Milk	...	...	...	...	...	57-3	98-3	82-8	103-6
Deductions	...	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	...	...	...	...
Points for time since Calving	...	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED	...	...	...	...	...	...	...	...	...
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	...	...	...	...	...
Points for time since Calving ...	...	...	...	...	...	...	...	...	...
Total Points per 1,000 lbs. live weight	...	...	...	...	...	...	...	...	...
Remarks and Awards	...	...	...	...	...	...	3rd Prize.	Highly Commended.	Highly Commended.

CLASS 22.—AYRSHIRE HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

Number Name ...	253 Byreholm Grace.	254 Byreholm Gay Lass 2nd.	257 Ickham Lucy.	258 Linnhead Cora Linn 2nd.
Born ...	Feb. 11, 1926. 1,069 Sept. 10. 43	Feb. 18, 1926. 1,042 Sept. 22. 31	Sept. 6, 1925. 1,146 Aug. 28. 36	Dec. 3, 1925. 1,004 Sept. 24. 29
Lave weight, in lbs. ...	Morn. Aft. Even. 15-0 15-9 15-1 16-2 16-0 15-2	Morn. Aft. Even. 18-5 15-3 15-1 16-0 15-0 15-6	Morn. Aft. Even. 19-4 18-4 18-3 18-7 16-2 17-8	Morn. Aft. Even. 19-1 10-0 18-9 20-8 18-8 18-4
Days since Calving ...	31-2 31-9 30-6	31-5 30-3 30-7	38-1 34-7 36-1	39-9 37-3 37-3
Weight of Milk, 1st day	15-6 15-95 15-3	15-75 15-15 15-35	19-05 17-35 18-05	19-05 18-05 18-65
Weight of Milk, 2nd day	3-62 4-07 3-13	3-78 4-30 3-59	3-90 3-66 4-08	4-16 3-50 3-94
Total	9-34 9-33 9-50	8-84 8-82 9-21	8-74 9-12 9-24	8-94 9-12 9-30
Percentage { Fat Composition of { Solids other than Fat	12-90 13-40 12-72	12-62 13-12 13-80	12-64 12-78 13-32	13-10 12-02 13-20
Constituents of { Milk Total Solids	0-505 0-65 0-48	0-595 0-65 0-55	0-745 0-635 0-74	0-83 0-65 0-74
Actual weight of Fat, in lbs.	11-3 13-0 9-6	11-9 13-0 11-0	14-9 12-7 14-8	16-6 13-0 14-8
Calculation of Points multiply by 20	1-46 1-49 1-47	1-30 1-34 1-41	1-67 1-58 1-67	1-79 1-70 1-73
Actual weight of Solids other than Fat, in lbs.	5-84 5-96 5-88	5-56 5-30 5-64	6-68 6-32 6-68	7-16 6-80 6-92
Calculation of Points multiply by 4	46-85 33-80 17-68	46-25 35-9 16-56	54-45 42-40 19-68	57-25 44-4 20-88
For weight of Milk (lbs.) ...	98-4	98-7	116-5	122-5
For weight of Fat (lbs. x 20)	98-4	98-7	116-5	122-5
For weight of Solids other than Fat (lbs. x 4)	0-3	—	1-6	—
Total Points for Milk	98-7	98-7	118-1	122-5
Deductions	92-0 0-3	94-5 —	101-5 1-6	111-8
TOTAL POINTS GAINED FOR MILK	92-3	94-5	103-1	111-8
Points for time since Calving	Highly Commended.	Highly Commended.	2nd Prize.	1st Prize.
TOTAL POINTS GAINED	Highly Commended.	Highly Commended.	2nd Prize.	1st Prize.
Points gained for Milk per 1,000 lbs. live weight	Highly Commended.	Highly Commended.	2nd Prize.	1st Prize.
Points for time since Calving	Highly Commended.	Highly Commended.	2nd Prize.	1st Prize.
Total Points per 1,000 lbs. live weight	Highly Commended.	Highly Commended.	2nd Prize.	1st Prize.
Remarks and Awards	Highly Commended.	Highly Commended.	2nd Prize.	1st Prize.

CLASS 22.—AYRESHIRE HEIFERS (BORN ON OR AFTER 1ST AUGUST, 1925)—Continued.

259							261						
Low Balcaray Lucy.							Valleyfield Tibbie 10th.						
Number	...	...	...	...	...	...	Jan. 12, 1926.	...	Jan. 27, 1926.	...	...
Name	...	...	...	...	...	...	1,092	...	1,020	...	...
Born	...	...	...	...	...	...	Sept. 29.	...	Sept. 11.	...	...
Live weight, in lbs.	...	...	...	...	...	...	24	...	42	...	...
Last Calved	...	...	...	...	...	...		...		...	...
Days since Calving	...	...	...	...	...	...		...		...	...
Weight of Milk, 1st day	...	...	...	...	...	...	Morn.	Aft.	Morn.	Aft.	Even.
Weight of Milk, 2nd day	...	...	...	...	...	...	15-9	14-5	18-7	17-6	17-2
	...	...	...	...	...	...	13-7	16-3	17-4	16-2	17-6
Total	...	...	...	...	...	...	31-6	30-8	36-1	33-8	34-8
Average	...	...	...	...	...	...	15-8	15-4	18-05	16-9	17-4
Percentage of Fat	...	...	...	...	...	...	4-55	5-40	2-89	3-16	2-51
Composition of Solids other than Fat	...	...	...	...	...	...	9-33	9-04	9-19	9-22	9-53
the Milk. Total Solids	...	...	...	...	...	...	13-88	14-44	12-08	12-38	12-04
Actual weight of Fat, in lbs.	...	...	...	...	...	...	0-72	0-83	0-52	0-53	0-435
Calculation of Points multiply by 20	...	...	...	...	...	...	14-4	16-6	10-4	10-6	8-7
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	...	1-48	1-39	1-66	1-56	1-66
Calculation of Points multiply by 4	...	...	...	...	...	...	5-92	5-56	6-64	6-24	6-64
Points—	...	...	...	...	...	...		46-95		52-35	
For weight of Milk (lbs.) ...	...	...	...	...	...	...		46-0		29-70	
For weight of Fat (lbs. × 20) ...	...	...	...	...	...	...		17-04		19-52	
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...	...	...	
Total Points for Milk	...	...	...	...	...	...	109-0		101-6		
Deductions	...	...	...	...	...	...	—		20-0		
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	...	109-0		81-6		
Points for time since Calving	...	...	...	...	...	...	—		0-2		
TOTAL, POINTS GAINED	...	...	...	...	...	...	109-0		81-8		
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	...	99-8		80-0		
Points for time since Calving	...	...	...	...	...	...	—		0-2		
Total Points per 1,000 lbs. live weight	...	...	...	...	...	...	99-8		80-2		
Remarks and Awards	...	...	...	...	...	...	Reserve.		Highly Commended.		

CLASS 23.—GUERNSEY COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK.
BORN ON OR PREVIOUS TO 1ST AUGUST, 1923).

Number Name ...	...	...	...	...	...	202 Froome Isabel 2nd.		208 Hadham Golden Cloud 8th.		205 Southern Starrette.	
						May 15, 1922, 1,206 Mar. 20, 217		Nov. 19, 1922, 995 Sept. 15, 38		Dec. 10, 1920, 1,152 Sept. 10, 43	
Born ...	...	...	...	...	...	Morn. Aft. Even.		Morn. Aft. Even.		Morn. Aft. Even.	
Live weight, in lbs. ...	...	...	...	...	...	19.1 13.8 11.7		14.0 18.9 15.7		18.8 18.9 20.3	
Last Calved ...	...	...	...	...	...	12.9 11.9 11.0		15.3 17.7 16.7		19.9 20.0 19.3	
Days since Calving ...	...	...	...	...	...	22.0 25.7 22.7		29.3 36.6 32.4		33.7 38.9 39.6	
Weight of Milk, 1st day ...	...	...	...	...	...	11.0 12.85 11.35		14.65 18.3 16.2		19.35 19.45 19.80	
Weight of Milk, 2nd day ...	...	...	...	...	...	4.64 5.08 5.12		3.89 5.42 4.03		3.57 4.27 4.09	
Total ...	...	...	...	...	...	9.26 9.38 9.68		9.25 9.14 9.17		9.05 9.27 9.13	
Average ...	...	...	...	...	...	13.90 14.46 14.80		13.14 14.56 13.20		12.62 13.54 13.24	
Percentage { Fat	...	...	...	...	...	0.565 0.65 0.58		0.57 0.99 0.655		0.69 0.83 0.81	
Composition of { Solids other than Fat	...	...	...	...	...	10.1 13.0 11.6		11.4 10.8 13.1		13.8 16.6 16.2	
the Milk. { Total Solids	...	...	...	...	...	1.02 1.21 1.10		1.36 1.67 1.49		1.75 1.80 1.81	
Actual weight of Fat, in lbs. ...	...	...	...	...	...	4.08 4.84 4.4		5.44 6.68 5.96		7.00 7.20 7.24	
Calculation of Points multiply by 20 ...	...	...	...	...	...	35.20		49.15		58.60	
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	34.70		44.80		46.60	
Points—	...	...	...	...	...	13.82		18.08		21.44	
For weight of Milk (lbs.) ...	...	...	...	...	...	83.2		111.5		120.6	
For weight of Fat (lbs. × 20)	...	...	...	...	...	—		—		—
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...	...	83.2		111.5		120.6	
Total Points for Milk	...	...	...	...	...	83.2		111.5		120.6	
Deductions	...	...	...	...	...	—		—		—
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	83.2		111.5		120.6	
Points for time since Calving	...	...	...	...	...	12.0		—		0.3	
TOTAL POINTS GAINED	...	...	...	...	...	95.2		111.5		120.9	
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	69.1		112.3		109.8	
Points for time since Calving	...	...	...	...	...	12.0		—		0.3	
Total Points per 1,000 lbs. live weight	...	...	...	...	...	81.1		112.3		110.1	
Remarks and Awards	...	...	...	...	...	3rd Prize.		2nd Prize.		1st Prize.	

CLASS 24.—GUERNSEY COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK.
BORN AFTER 1ST AUGUST, 1923, AND PREVIOUS TO 1ST AUGUST, 1925).

Number Name ..	266 Calehill Dewdrop.	268 Nazeling Martigold 3rd.	270 Bosistown Nemesia.	271 Rose of the Old Mill.
Born ...	Mar. 14, 1924. 1,113 June 2.	Oct. 18, 1924. 1,034 June 27. 118	July 21, 1924. 976 Aug. 29. 55	Aug. 3, 1924. 926 July 15. 100
Live weight, in lbs. ...	Morn. Aft. Even. 15-6 14-5 14-5	Morn. Aft. Even. 11-5 5-9 17-9	Morn. Aft. Even. 10-4 15-3 17-0	Morn. Aft. Even. 12-4 12-0 12-7
Last Calved ...	14-2 15-8 12-7	14-4 12-6 12-2	17-3 10-8 14-2	12-3 12-5 12-7
Days since Calving ...	29-8 30-3 27-2	25-9 13-5 30-1	33-7 32-1 31-2	24-7 24-5 25-4
Weight of Milk, 1st day	14-9 15-15 13-6	12-95 9-25 15-05	10-85 16-05 15-6	12-85 12-25 12-7
Weight of Milk, 2nd day	4-92 5-45 4-81	4-52 2-87 3-73	5-00 4-55 3-73	5-06 5-48 4-74
Total	9-32 9-33 9-43	8-96 9-49 9-33	8-92 9-17 9-41	8-70 8-76 8-76
Percentage { Fat Composition of Solids other than Fat	14-24 14-78 14-24	13-48 12-36 13-06	13-92 13-72 13-14	13-76 14-24 13-50
the Milk. { Total Solids	0-735 0-83 0-655	0-585 0-27 0-56	0-84 0-73 0-58	0-625 0-67 0-6
Actual weight of Fat, in lbs.	14-7 16-6 13-1	11-7 5-4 11-2	10-8 14-6 11-6	12-5 13-4 12-0
Calculation of Points multiply by 20	1-39 1-41 1-28	1-16 0-88 1-40	1-50 1-47 1-47	1-075 1-07 1-11
Actual weight of Solids other than Fat, in lbs.	5-56 5-64 5-12	4-64 3-52 5-60	6-00 5-88 5-88	4-800 4-28 4-44
Calculation of Points multiply by 4	43-65 14-68 16-32	47-25 36-48 13-76	48-50 38-70 17-76	37-80 37-80 18-02
For weight of Milk (lbs.) ...	104-4	79-3	109-3	88-2
For weight of Fat (lbs. × 20)	—	10-0	—	—
For weight of Solids other than Fat (lbs. × 4)	—	—	—	—
Total Points for Milk	104-4	79-3	109-3	88-2
Deductions	—	—	—	—
TOTAL POINTS GAINED FOR MILK	104-4	69-3	109-3	88-2
Points for time since Calving	10-3	7-8	1-5	6-0
TOTAL POINTS GAINED	114-7	77-1	110-8	94-2
Points gained for Milk per 1,000 lbs. live weight	93-8	66-9	112-1	95-3
Points for time since Calving	10-3	7-8	1-5	6-0
Total Points per 1,000 lbs. live weight	104-1	74-7	113-6	101-3
Remarks and Awards	1st Prize.	Highly Commended.	2nd Prize.	3rd Prize.

CLASS 25.—GUERNSEY HEIFERS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF.)

Number Name ...	273 Hindhead Patricia 3rd.	274 Nelly's Pride of the Blanche.	275 Devonhouse Primrose.	276 Ringwould Gracful.
Born ...	Dec. 7, 1925. 1,028 Oct. 4. 19	Mar. 14, 1926. 716 Oct. 1. 22	Aug. 30, 1925. 502 Mar. 3. 234	Dec. 30, 1925. 892 Aug. 2. 82
Live weight, in lbs. ...	Morn. Even. 15.7 17.1 15.7 16.1	Morn. Aft. Even. 11.1 10.8 10.3 11.2 11.3 12.0	Morn. Aft. Even. 7.5 8.6 8.8 8.6 8.7 8.8	Morn. Aft. Even. 13.4 13.3 13.6 13.6 13.5 12.5
Last Calved ...	...	...	...	...
Days since Calving ...	...	...	...	...
Weight of Milk, 1st day ...	...	...	...	...
Weight of Milk, 2nd day ...	...	...	...	...
Total	31.4	22.3	17.3	26.8
Average	13.7	11.05	8.65	13.4
Percentage { Fat ...	3.58	3.62	4.82	3.56
Composition of { Solids other than Fat ...	8.78	9.08	9.32	9.20
the Milk. { Total Solids ...	12.36	12.70	14.10	12.76
Actual weight of Fat, in lbs. ...	0.50	0.405	0.39	0.48
Calculation of Points multiply by 20 ...	11.2	8.1	7.8	9.6
Actual weight of Solids other than Fat, in lbs. ...	1.88	1.01	0.75	1.24
Calculation of Points multiply by 4 ...	5.52	4.04	3.00	4.96
For weight of Milk (lbs.) ...	32.3	33.35	26.0	39.45
For weight of Fat (lbs. x 20) ...	25.3	26.00	23.1	31.00
For weight of Solids other than Fat (lbs. x 4) ...	11.48	12.40	9.7	14.80
Total Points for Milk ...	69.1	71.8	58.8	85.8
Deductions ...	—	—	—	—
TOTAL POINTS GAINED FOR MILK	69.1	71.8	58.8	85.8
Points for time since Calving ...	—	—	12.0	4.2
TOTAL POINTS GAINED	69.1	71.8	70.8	90.0
Points gained for Milk per 1,000 lbs. live weight	67.2	100.0	65.3	96.2
Points for time since Calving ...	—	—	12.0	4.2
Total Points per 1,000 lbs. live weight	67.2	100.0	77.3	100.4
Remarks and Awards ...	Reserve.	2nd Prize.	3rd Prize.	1st Prize.

CLASS 26.—JERSEY COWS (ENGLISH OR ISLAND BRED. ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR PREVIOUS TO 1ST AUGUST, 1923).

Number Name ...	...	...	...	...	...	277 Blue Hayes Sportan.	278 Sixty Five.		279 Flotsam Twin.		280 Demure Princess.
Born ...	...	...	...	...	...	Dec. 16, 1917.	July 24, 1922.	Jan. 8, 1923.	April 21, 1918.		
Live weight, in lbs. ...	...	...	...	...	...	896	936	810	823		
Last Calved ...	...	...	...	...	...	April 24.	Sept. 6.	May 29.	July 13.		
Days since Calving ...	...	...	...	...	...	182	47	147	102		
Weight of Milk, 1st day	...	...	...	...	...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.		
Weight of Milk, 2nd day	...	...	...	...	...	17-0 14-0 12-4	20-6 20-6 20-2	11-9 10-7 0-9	13-4 17-5 17-8		
Total	...	...	...	...	...	8-7 15-3 11-1	19-6 19-7 19-4	12-2 11-3 10-7	10-4 16-0 14-5		
Average	...	...	...	...	...	25-7 29-3 23-5	40-2 40-3 39-6	24-1 22-0 20-0	25-8 33-5 31-8		
Percentage of Fat	...	...	...	...	...	12-85 14-65 11-75	20-1 20-15 19-8	12-05 11-0 10-3	14-9 16-75 15-9		
Composition of the Milk.	...	...	...	...	...	4-11 7-08 6-75	4-43 5-21 4-22	4-85 4-58 4-00	4-10 5-52 5-61		
Actual weight of Fat, in lbs.	...	...	...	...	...	9-41 9-28 9-29	8-97 9-61 9-66	9-03 9-50 9-78	9-04 9-42 9-43		
Calculation of Points multiply by 20	...	...	...	...	...	13-52 16-36 16-04	13-40 14-82 13-88	13-38 14-08 13-78	13-14 14-94 15-04		
Actual weight of Fat, in lbs.	...	...	...	...	...	0-53 1-04 0-79	0-89 1-05 0-84	0-525 0-505 0-41	0-61 0-925 0-89		
Calculation of Points multiply by 20	...	...	...	...	...	10-6 20-8 15-8	17-8 21-0 16-8	10-5 10-1 8-2	12-2 18-5 17-8		
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	1-21 1-36 1-09	1-8 1-94 1-92	1-09 1-045 1-0	1-86 1-58 1-5		
Calculation of Points multiply by 4	...	...	...	...	...	4-84 5-44 4-36	7-20 7-76 7-08	4-36 4-18 4-0	5-40 6-32 6-0		
Points—	...	...	...	...	...	
For weight of Milk (lbs.) ...	...	...	...	...	...	39-25	60-05	33-85	47-55		
For weight of Fat (lbs. × 20)	...	...	...	...	...	47-20	55-00	28-50	48-50		
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...	...	14-64	22-64	12-64	17-72		
Total Points for Milk	...	...	...	...	...	101-1	138-3	74-7	113-8		
Deductions	...	...	...	...	...	—	—	—	—
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	101-1	138-3	74-7	113-8		
Points for time since Calving	...	...	...	...	...	12-0	0-7	10-7	6-2		
TOTAL POINTS GAINED	...	...	...	...	...	113-1	139-0	85-4	120-0		
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	112-8	147-75	92-5	138-2		
Points for time since Calving	...	...	...	...	...	12-0	0-7	10-7	6-2		
Total Points per 1,000 lbs. live weight	...	...	...	...	...	124-8	148-5	103-2	144-4		
Remarks and Awards	...	...	...	...	...	Reserve.	First Prize.		Second Prize.		

CLASS 26.—JERSEY COWS (ENGLISH OR ISLAND BRED, BORN ON OR PREVIOUS TO 1ST AUGUST, 1923).—Continued.

Number	293	294	295	296	297	298
Name	Ufrica's Love.	Gloria.	Postgirl 2nd.	Nimrod's Primrose.	Red Negundo.	Majestic's Peggy.
Born	Nov. 14, 1920.	May 2, 1924.	Jan. 19, 1925.	Feb. 5, 1925.	June 27, 1924.	Mar. 21, 1925.
Live weight, in lbs.	462	852	946	770	766	930
Last Calving	May 26.	June 8.	Mar. 20.	July 2.	Aug. 24.	Mar. 21.
Days since Calving	150	137	217	113	60	216
Weight of Milk, 1st day	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	20.1 18.1	14.6 15.0	19.3 16.2	23.0 18.2	20.2 22.2	19.2 19.7
Total	40.2 38.1	31.2 31.2	38.6 32.5	41.2 33.4	41.7 44.5	39.0 39.0
Average	20.1	15.6	18.45	10.6	20.85	19.95
Percentage	6.00	6.22	5.27	3.65	5.05	4.85
Composition of the Milk.	9.54 9.15	9.76 9.72	9.25 9.23	10.81 8.65	9.83 9.19	9.61 8.90
Actual weight of Fat, in lbs.	15.54 15.54	15.98 16.86	14.52 13.80	13.96 17.58	14.88 15.18	14.46 14.56
Calculation of Points multiply by 20	1.20 1.22	0.97 1.12	0.97 0.745	0.71 1.50	1.05 1.83	1.07 1.09
Actual weight of Solids other than Fat, in lbs.	24.0	19.4	19.4	14.3	21.0	19.4
Calculation of Points multiply by 4	1.92	1.52	1.71	2.02	3.05	1.92
Points—	7.68	6.08	6.84	8.08	8.16	7.68
For weight of Milk (lbs.)	39.15	31.20	34.70	36.30	43.10	39.45
For weight of Fat (lbs. x 20)	48.40	41.80	34.30	44.30	47.60	41.20
For weight of Solids other than Fat (lbs. x 4)	14.64	12.16	12.84	13.88	16.86	14.68
Total Points for Milk	102.2	85.2	81.8	94.5	107.1	95.3
Deductions	—	—	—	—	—	—
TOTAL POINTS GAINED FOR MILK	102.2	5.2	81.8	94.5	107.1	95.3
Points for time since Calving	11.0	9.7	12.0	7.3	2.0	12.0
TOTAL POINTS GAINED	113.2	94.9	93.8	101.8	109.1	107.33
Points gained for Milk per 1,000 lbs. live weight.	106.4	99.90	86.6	122.6	139.8	102.4
Points for time since Calving	11.0	9.7	12.0	7.3	2.0	12.0
Total Points per 1,000 lbs. live weight	117.4	109.7	98.6	129.9	141.8	114.4
Remarks and Awards	Third Prize.	Highly Commended.	Highly Commended.	Highly Commended.	Second Prize.	Third Prize.

CLASS 27.—JERSEY COWS (BORN AFTER 1ST AUGUST, 1923)—Continued.

Number Name ...	...	...	...	...	300 Blue Hayes Noble Star.	301 Golden Beech Daisy.	302 Belle des Noyers.	305 Spring Golden Fleece.
Born ...	...	...	...	...	Dec. 15, 1923. 1,148 May 20. 147	Aug. 25, 1923. 868 June 24. 121	April 18, 1924. 978 Aug. 13. 71	Sept. 18, 1924. 1,034 Sept. 7. 46
Live weight, in lbs. ...	...	...	...	...	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.	Morn. Aft. Even.
Last Calved ...	...	...	...	...	10-1 14-3 14-3	16-2 15-4 13-8	5-8 5-5 5-2	12-0 13-3 12-2
Days since Calving ...	...	...	...	...	12-5 15-5 13-6	15-2 14-2 12-7	6-3 6-2 6-5	14-0 14-1 12-8
Weight of Milk, 1st day ...	...	...	...	...	31-6 29-8 27-9	31-4 29-6 26-5	12-1 11-7 11-7	26-0 27-4 26-0
Weight of Milk, 2nd day ...	...	...	...	...	15-8 14-0 13-05	15-7 14-8 13-25	6-05 5-85 5-85	13-45 13-7 13-0
Total ...	...	...	...	...	5-74 6-28 4-91	4-12 5-33 3-81	5-44 7-35 6-11	4-91 4-80 4-42
Average ...	...	...	...	...	0-26 9-36 0-50	6-18 9-49 9-51	9-56 9-71 9-69	9-47 9-61 9-60
Percentage { Fat ...	...	...	...	...	13-00 13-23 14-23	13-80 14-82 13-82	15-00 17-06 15-80	14-38 14-50 14-02
Composition of the Milk. { Solids other than Fat ...	...	...	...	...	0-91 0-935 0-685	0-645 0-79 0-505	0-33 0-43 0-36	0-66 0-67 0-575
Actual weight of Fat, in lbs. ...	...	...	...	...	18-2 18-7 13-7	12-9 15-8 10-1	6-6 8-6 7-2	13-2 13-4 11-5
Calculation of Points multiply by 20 ...	...	...	...	...	1-46 1-4 1-31	1-44 1-41 1-26	0-58 0-57 0-57	1-27 1-32 1-25
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	5-84 5-6 5-24	5-76 5-64 5-04	2-32 2-28 2-28	5-08 5-28 5-0
Calculation of Points multiply by 4 ...	...	...	...	...	44-65	43-75	17-75	40-15
For weight of Milk (lbs.) ...	...	...	...	...	50-60	38-80	22-40	38-10
For weight of Fat (lbs. x 20) ...	...	...	...	...	16-68	16-44	6-88	15-36
For weight of Solids other than Fat (lbs. x 4) ...	...	...	...	...	111-9	99-0	47-0	93-6
Total Points for Milk ...	...	...	...	...	...	...	...	...
Deductions ...	...	...	...	...	...	...	...	...
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	111-9	99-0	47-0	93-6
Points for time since Calving ...	...	...	...	...	10-7	8-1	3-1	0-6
TOTAL POINTS GAINED ...	...	...	...	...	122-6	107-1	50-1	94-2
Points gained for Milk per 1,000 lbs. live weight ...	...	...	...	...	97-4	114-1	48-1	90-6
Points for time since Calving ...	...	...	...	...	10-7	8-1	3-1	0-6
Total Points per 1,000 lbs. live weight ...	...	...	...	...	108-1	122-2	51-2	91-2
Remarks and Awards ...	...	...	...	...	1st Prize.	Reserve.		Highly Commended.

CLASS 28.—JERSEY HEIFERS—(ENGLISH OR ISLAND BRED, ENTERED IN OR ELIGIBLE FOR THE HERD BOOK, AND WHICH HAVE PRODUCED THEIR FIRST AND ONLY CALF AT OR UNDER THE AGE OF 2½ YEARS).

Number Name	308 Culverden Consus Maid.	310 May Flower.	311 Vulton Air Maiden.	313 Fancy Edna.	314 Sweet Daisy.
Born	April 15, 1926. 718	May 26, 1926. 840	May 18, 1926. 865	July 17, 1926. 666	May 13, 1926. 826
Live weight, in lbs.	Sept. 10. 43	Oct. 6. 17	June 5. 140	Sept. 18. 35	Sept. 4. 49
Last Calved					
Days since Calving					
Weight of Milk, 1st day	Morn. Aft. Even. 14.4 13.7 13.2	Morn. Even. 13.7 13.4	Morn. Even. 14.9 13.7	Morn. Even. 13.0 13.3	Morn. Even. 14.7 14.2
Weight of Milk, 2nd day	14.1 14.6 13.5	10.7	13.0 10.4	12.9 12.9	14.7 14.8
Total	28.5 30.3 27.7	31.9 31.1	29.9 29.0	25.9 26.2	30.2 31.0
Average	14.25 15.15 13.85	15.05 15.55	14.95 14.5	12.95 13.1	15.1 15.5
Percentage of Fat	3.83 5.04 3.96	5.44 5.07	5.22 4.07	4.50 4.59	3.86 4.56
Concentration of Milk	13.32 14.68 13.62	10.28 9.81	9.28 9.17	9.64 9.53	9.76 9.30
Actual weight of Fat, in lbs.	0.545 0.76 0.55	0.87 0.79	0.78 0.68	0.58 0.60	0.58 0.71
Calculation of Points multiply by 20	10.9 15.2 11.0	17.4 15.8	15.6 18.6	11.6 12.0	11.6 14.2
Actual weight of Solids other than Fat, in lbs.	1.35 1.46 1.34	1.64 1.53	1.39 1.33	1.25 1.25	1.47 1.44
Calculation of Points multiply by 4	5.40 5.84 5.36	6.56 6.12	5.56 5.32	5.0 5.0	5.88 5.76
For weight of Milk (lbs.)	43.25	31.50	30.45	26.05	30.90
For weight of Fat (lbs. x 20)	37.10	33.20	29.20	23.80	25.80
For weight of Solids other than Fat (lbs. x 4)	16.60	12.68	10.88	10.00	11.64
Total Points for Milk	97.0	77.4	69.5	59.7	68.0
Deductions					
TOTAL POINTS GAINED FOR MILK	97.0	77.4	69.5	59.7	68.0
Points for time since Calving	0.3		10.0		0.9
TOTAL, POINTS GAINED	97.3	77.4	79.5	59.7	68.9
Points gained for Milk per 1,000 lbs. live weight.	135.0	92.0	80.4	89.5	82.4
Points for time since Calving	0.3		10.0		0.9
Total Points per 1,000 lbs. live weight	135.3	92.0	90.4	89.5	83.3
Remarks and Awards	1st Prize.	Highly Commended.	Reserve.		Highly Commended.

CLASS 28.—JERSEY HEIFERS (ENGLISH OR ISLAND BRED)—Continued.

CLASS 29.—KERRY COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK).					CLASS 29.—KERRY COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK).				
Number	...	...	...	...	324 Golden Dream.	326 Wadlands Sloeberry.	328 Wadlands Sweet Clover.	330 Rosebud of Carton.	334 Hattingley Beauty.
Born	...	...	...	...	Sept. 9, 1926.	Sept. 19, 1922.	Aug. 31, 1923.	Mar. 10, 1910.	Jan. 21, 1923.
Live weight, in lbs.	...	...	...	...	676	824	935	1092	878
Last Calved	...	...	...	...	Sept. 25.	Oct. 1.	Sept. 28.	Sept. 16.	July 10.
Days since Calving	...	...	...	...	28	22	25	37	105
Weight of Milk, 1st day	...	...	...	...	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Aft. Even.
Weight of Milk, 2nd day	...	...	...	...	9.3 10.9	17.0 14.8	21.7 22.5	16.5 15.1	12.8 13.6
	...	...	...	...	10.9 10.9	16.9 17.9	21.8 22.0	13.6 15.4	14.6 13.7
Total	...	...	...	...	20.2 21.8	33.9 32.7	43.5 40.5	30.1 30.5	27.4 28.5
Average	...	...	...	...	10.1 10.9	16.95 16.35	21.75 23.25	15.05 15.25	13.7 14.25
Percentage (Fat	...	...	...	...	5.41 5.81	4.62 3.86	4.15 3.97	0.86 0.43	2.74 3.64
Composition of Solids other than Fat	...	...	...	...	9.97 9.63	9.06 9.22	9.39 9.45	9.84 9.15	8.88 8.99
the Milk. Total Solids	...	...	...	...	15.38 15.44	13.08 13.08	13.54 13.42	16.20 15.58	11.62 12.70
Actual weight of Fat, in lbs.	...	...	...	...	0.55 0.635	0.78 0.63	0.90 0.925	1.03 0.98	0.375 0.515
Calculation of Points multiply by 20	...	...	...	...	11.0 12.7	15.6 12.6	18.0 18.5	20.6 19.6	7.50 10.30
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	1.01 1.05	1.53 1.51	2.04 2.20	1.41 1.40	1.22 1.29
Calculation of Points multiply by 4	...	...	...	...	4.04 4.20	6.12 6.04	8.16 8.80	5.64 5.60	4.88 5.16
Points—	...	...	...	...	21.00	33.30	45.00	30.30	42.10
For weight of Milk (lbs.)	...	...	...	...	23.70	28.20	36.00	40.20	27.10
For weight of Fat (lbs. × 20)	...	...	...	...	8.24	12.16	16.96	11.24	15.12
For weight of Solids other than Fat (lbs. × 4)	...	...	...	...	52.9	73.7	98.5	81.7	84.3
Total Points for Milk	...	...	...	...	52.9	73.7	98.5	81.7	84.3
Deductions	...	...	...	...	—	—	—	—	10.0
TOTAL POINTS GAINED FOR MILK	...	...	...	...	52.9	73.7	98.5	81.7	74.3
Points for time since Calving	...	...	...	...	—	—	—	—	6.5
TOTAL POINTS GAINED	...	...	...	...	52.9	73.7	98.5	81.7	80.8
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	78.2	89.5	105.1	74.8	84.8
Points for time since Calving	...	...	...	...	—	—	—	—	6.5
Total Points per 1,000 lbs. live weight	...	...	...	...	78.2	89.5	105.1	74.8	91.3
Remarks and Awards	...	...	...	...	...	...	1st Prize.	2nd Prize.	3rd Prize.

Class 30.—KERRY HEIFERS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK. BORN ON OR AFTER 1ST AUGUST, 1925, AND HAVING PRODUCED ONLY ONE CALF).

[illegible]

CLASS 31.—DEXTER COWS (ENTERED IN OR ELIGIBLE FOR THE HERD BOOK).

Number Name	...	...	...	...	...	338 Grinstead Taxus.	339 Barbara.	340 Braxted Winkie.
Born	...	...	...	...	...	June 19, 1921. 756	1915. 743	Dec. 24, 1924. 780
Live weight, in lbs.	...	...	...	...	...	Aug. 29, 55	May 25, 151	Aug. 13, 71
Last Calved	...	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	...	Morn. Even. 22-3 25-3	Morn. Aft. Even. 10-9 11-3 11-5	Morn. Aft. Even. 12-2 12-8 11-4
Weight of Milk, 2nd day	...	...	...	...	...	21-5 25-3	11-7 10-9 10-8	14-2 12-7 13-6
Total	...	...	...	...	...	43-8 50-6	22-6 22-2 22-3	26-4 25-5 25-0
Average	...	...	...	...	...	21-9 25-3	11-3 11-1 11-15	13-2 12-75 12-5
Percentage of Fat	...	...	...	...	...	4-20 4-08	3-68 3-69 4-19	4-54 4-18 3-06
Composition of the Milk.	...	...	...	...	...	9-56 9-54	9-02 8-83 9-13	8-94 8-82 8-88
Actual weight of Fat, in lbs.	...	...	...	...	...	13-76 13-62	12-70 12-22 13-34	13-48 13-00 11-94
Calculation of Points multiply by 20	...	...	...	...	...	0-92 1-035	0-42 0-41 0-465	0-60 0-53 0-385
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	18-4 20-7	8-4 8-2 9-3	12-0 10-6 7-7
Calculation of Points multiply by 4	...	...	...	...	...	2-1 2-42	1-02 0-99 1-02	1-18 1-12 1-11
Points—For weight of Milk (lbs.)	...	...	...	...	...	8-4 9-68	4-08 3-96 4-08	4-72 4-48 4-44
For weight of Fat (lbs. x 20)	...	...	...	...	...	47-20	33-55	38-45
For weight of Solids other than Fat (lbs. x 4)	...	...	...	...	...	39-10	25-90	30-30
Total Points for Milk	...	...	...	...	...	18-08	12-12	13-64
Deductions	...	...	...	...	...	104-4	71-6	82-4
TOTAL POINTS GAINED FOR MILK	...	...	...	...	...	104-4	71-6	82-4
Points for time since Calving	...	...	...	...	...	1-5	11-1	2-5
TOTAL POINTS GAINED	...	...	...	...	...	105-9	82-7	84-9
Points gained for Milk per 1,000 lbs. live weight	...	...	...	...	...	138-0	96-5	105-4
Points for time since Calving	...	...	...	...	...	1-5	11-1	2-5
Total points per 1,000 lbs. live weight	...	...	...	...	...	139-5	107-6	107-9
Remarks and Awards	...	...	...	...	...	1st Prize.	3rd Prize.	2nd Prize.

THE MILKING TRIALS FOR GOATS, 1928.

By THOS. W. PALMER.

THE Milking Competitions for the goats were on the same lines as at the 1926 Show, but it is disappointing to report decreased entries.

In the "Star" or "Q Star" Class, the entries numbered 13 comparing with 16, whilst in the Non-Star Class only five entries were made against 11, the total being 18, which is nine less than at the 1926 Show. For the purposes of record, it might be well to mention that at the 1927 Show, the entries were 19 in the Star Class, and eight in the Non-Star Class.

Class 38. She Goats, qualified as "Star" or "Q Star" milkers. Of the 13 entries, four failed to appear, but the competition was keen, and at the end of the first day, three of the goats had yielded 13·2 lbs., 12·5 lbs. and 11·2 lbs. At the close of the trials, the two former goats had dropped a little in quantity, but the third had maintained its yield, and this fact, plus a slight advantage in lactation and better quality of butter fat, enabled it to come in a good second. The final result was that Mrs. Abbey's "Didgemere Dixie" Q**Q* was first, with a total of 31·74, made up as follows:—Milk 12·65, butter fat 11·58, solids not fat 4·41, lactation 3·1. The second position was held by Mrs. Browell's "Play of Bashley" Q*Q*Q*Q*, with a total of 31·14, comprising milk 11·2, butter fat 12·46, solids not fat 3·98, lactation 3·5, and third, Mrs. Maurice's "Ch. Ridgeway Runel" Q*Q*, total 30·20, i.e., milk 11·95, butter fat 10·80, solids not fat 4·15, lactation 3·3. In addition to winning first prize in this class, "Didgemere Dixie" Q**Q* obtained the Baroness Burdett Coutts' Cup and the Tremedda Selene Challenge Cup, the Dewar Perpetual Challenge Trophy and the Dual Purpose Challenge Certificate, and as she won first prize in Inspection (Class 42), together with the Challenge Certificate and Challenge Cup for the Best Goat over two years that has borne a kid, she repeated the success of her dam, "Didgemere Dream" Q**, at the 1925 Show, a feat which, as far as I know, is unparalleled.

In the Non-Star Class, three out of the five goats entered competed. The goat winning the first prize was Miss Harrison's "Sandhill Nerine," whose yield of milk was 8·35 and total points 20·26; the second prize winner was Miss Henderson's "Riding Cilla," yield 6·95, total 16·75, with Miss Harrison's "Leazes Saleswoman" third with a yield of 5·9 and total of 16·54.

The classes for Inspection were similar to those at the 1926 Show, and I now take the goats as classified for Inspection.

Class 43. She Goats, *Toggenburg*.—Seven entries for Inspection, three of whom were also entered in the Milking Trials; all three

competed in Class 42 (Non-Star Goats). First, Miss Harrison's "Sandhill Nerine," butter fat 3·44 and 3·68; yield 8·35, total 20·26. Second, Miss Henderson's "Riding Cilla," butter fat 4·40 and 3·89; yield 6·95, total 16·75. Third, Miss Harrison's "Leazes Saleswoman," butter fat 5·18 and 3·83; yield 5·9, total 16·54.

Class 44. She Goats, British Toggenburg or British Saanen.—Four entries in Inspection, three in milking, one of the latter absent. Mrs. Maurice's "Ch. Ridgeway Runel" Q*Q*, a British Saanen, was third in the Star Class (41); butter fat 4·80 and 4·21, yield 11·95, total 30·20. This goat, in conjunction with her stable companion "Ridgeway Runje," who was awarded first prize in the Saanen or British Saanen Goatling Class, obtained the Dewar Perpetual Challenge Cup. The other goat was a British Toggenburg, "Dupplin Dusk," butter fat 5·56 and 5·05, yield 6·05, total 16·52.

Class 45. British Alpine.—Five entered in Inspection and Milking, one absentee. All the milkers were in the Star Class. Mrs. Abbey's "Didgemere Dulcette" Q*Q** was Highly Commended, butter fat 3·89 and 4 per cent., yield 10·10, total 24·72. Mrs. Abbey's "Didgemere Drusilla" *Q*Q*Q*** also obtained a High Commendation, butter fat 3·56, both a.m. and p.m., milk 9·40, total 22·57. Miss Pope's "Pleader of Bashley" Q*Q*Q*Q*Q* was Highly Commended, butter fat 4·59 and 4·19, yield 9 lbs., total 22·04. This goat qualified for the Q*, having previously secured the Star. The remaining goat was "Didgemere Delysia" *Q*Q**, butter fat 3·72 and 3·28, yield 7·60, total 17·79.

Class 46. Saanen.—Four entries in Inspection, one entered in Milking, but was absent.

Class 47. Anglo-Nubian.—No entry.

Class 48. Any Other Variety.—Eight entries; six in Milking, all in the Star Class, three of whom were absent. Mrs. Abbey's "Didgemere Dixie" Q**Q* has already been referred to. She obtained first, butter fat 4·69 and 4·44, yield 12·65, total 31·74. Mrs. Browell's "Play of Bashley" Q*Q*Q*Q* was second, butter fat 5·59 and 5·53, yield 11·2, total 31·14. Miss Pope's "Proverb of Bashley" Q* was Reserve, butter fat 5·74 and 5·63, yield 9·9, total 28·43.

No goat was deficient in butter fat. The analysis of the milk showed the following results:—Nine samples were over 3 per cent. and under 4 per cent., eight samples were from 4 per cent. and under 5 per cent., whilst seven samples were over 5 per cent. and under 6 per cent. The lowest percentage of butter fat was 3·28 and the highest percentage 5·74.

The usual tabulated statements follow.

TABLE I.

Class.	Description.	Number in Class.		Average Live Weight.	Average Yield of Milk.	Highest Yield.	Lowest Yield.	Average period of Lactation.	Average Fat.	Average Solid not Fat.	Number of Animals below Standard for Fat.		Average Points Gained.
		Entered.	Com- peting.								a.m.	p.m.	
43	Toggenburg	3	3	lbs. 118	lbs. 7.06	lbs. 8.35	lbs. 5.9	days. 204	4.07	8.60	—	—	17.85
44	British Toggenburg or British Saanen	3	2	176	9.00	11.95	6.05	199	4.90	8.73	—	—	23.36
45	British Alpine	5	4	196	9.02	10.10	7.60	204	3.84	8.63	—	—	21.78
46	Saanen	1	—	—	—	—	—	—	—	—	—	—	—
47	Anglo-Nubian	—	—	—	—	—	—	—	—	—	—	—	—
48	Any Other Variety	6	3	187	11.25	12.65	9.9	242	5.27	8.86	—	—	30.43

TABLE II.

Description of Class.	Year of Show.	Number of Animals Competing.	Average live weight of each Animal.	Average period of Lactation.	Average weight of milk.		Average weight of milk per day.	Highest Yield.	Lowest Yield.	Percentages.			
					a.m.	p.m.				Fat.		Solids.	
			lbs.	days.						a.m.	p.m.	a.m.	p.m.
Star or Q Star Milkers	1920	7	130	219	3.9	3.2	7.1	9.0	4.9	4.61	4.72	9.02	9.17
"	1921	16	145	192	3.7	3.1	6.8	11.3	4.1	5.04	5.50	9.12	9.27
"	1922	14	144	190	4.4	3.6	7.0	12.6	5.6	4.60	4.52	9.07	9.19
"	1923	6	142	188	4.5	3.5	8.0	10.2	6.6	4.31	4.48	9.22	9.21
"	1924	12	149	200	4.5	3.3	7.8	11.25	4.65	4.81	5.25	8.78	8.98
"	1925	9	152	218	4.8	3.8	8.6	13.35	4.85	4.95	5.98	8.99	9.10
"	1926	7	168	189	5.08	4.88	9.96	12.3	7.15	4.38	4.63	8.53	8.64
"	1928	9	189	218	5.03	4.73	9.76	12.65	6.05	4.68	4.43	8.66	8.79
Not eligible as Star Milkers	1920	20	113	196	2.6	2.2	4.8	8.7	1.0	5.07	4.05	9.30	9.28
"	1921	14	123	145	3.3	2.8	6.1	9.4	2.9	5.10	4.06	8.75	8.88
"	1922	21	131	188	3.2	2.9	6.1	8.5	3.6	4.41	4.62	8.98	9.05
"	1923	5	127	147	3.9	2.9	6.8	8.5	5.1	3.96	4.78	8.93	8.90
"	1924	13	138	182	4.8	3.1	7.9	9.8	4.0	4.88	5.58	8.75	8.88
"	1925	7	131	180	3.4	2.8	6.2	8.25	3.85	4.86	5.38	9.08	8.95
"	1926	6	136	150	4.36	4.09	8.45	11.6	6.35	3.87	4.00	8.60	8.72
"	1928	3	118	204	3.58	3.48	7.06	8.35	5.9	4.34	3.80	8.62	8.58

CLASS 41.—SHE GOATS (QUALIFIED AS "STAR OR 'Q' STAR MILKERS").

Number Name	351 Dupplin Dusk.	353 Ridgeway Ranch.	355 Plender of Bashley.	356 Didgenere Delysua.	357 Didgenere Drusilla.	359 Didgenere Dulcette.
Born	Mar. 14, 1925. 150	May 15, 1925. 203	Mar. 28, 1926. 212	Mar. 6, 1926. 196	May 1, 1926. 187	April 6, 1923. 192
Lave weight, in lbs.	May 20. 156	Feb. 24. 242	May 15. 161	April 17. 189	Mar. 2. 235	Mar. 4. 233
Last Kidged						
Days since Kidging						
Weight of Milk, 1st day	Morn. Even. 3.2 3.0	Morn. Even. 6.8 5.7	Morn. Even. 4.4 4.7	Morn. Even. 4.2 4.1	Morn. Even. 3.0 4.4	Morn. Even. 3.0 4.5
Weight of Milk, 2nd day	3.1 2.8	5.9 5.5	4.5 4.4	3.6 3.3	4.7 4.7	5.0 4.7
Total	6.3 5.8	12.7 11.2	8.9 9.1	7.8 7.4	9.7 9.1	11.0 9.2
Average	3.15 2.9	6.35 5.6	4.45 4.55	3.9 3.7	4.85 4.55	5.5 4.6
Percentage Fat	5.56 5.05	4.80 4.21	4.59 4.19	3.72 3.28	3.56 3.56	3.89 4.00
Composition of Solids other than Fat	8.98 8.63	8.62 8.71	8.83 9.03	8.00 8.14	8.60 8.82	8.67 8.96
the Milk. Total Solids	14.54 13.68	13.42 12.92	13.42 13.22	11.72 11.42	12.16 12.38	12.56 12.96
Actual weight of Fat, in lbs.	0.175 0.147	0.305 0.235	0.205 0.191	0.145 0.122	0.173 0.162	0.214 0.184
Calculation of Points multiply by 20	3.50 2.94	6.10 4.70	4.10 3.82	2.90 2.44	3.46 3.24	4.28 3.68
Actual weight of Solids other than Fat, in lbs.	0.283 0.25	0.55 0.487	0.393 0.412	0.312 0.301	0.417 0.401	0.477 0.413
Calculation of Points multiply by 4	1.132 1.0	2.2 1.948	1.572 1.648	1.248 1.204	1.668 1.604	1.908 1.652
Points—						
For weight of Milk (lbs.)	6.05	11.95	9.0	7.60	9.4	10.10
For weight of Fat (lbs. × 20)	6.44	10.80	7.92	5.34	6.7	7.960
For weight of Solids other than Fat (lbs. × 4)	2.132	4.148	3.220	2.452	3.272	3.580
Total Points for Milk	14.622	26.898	20.14	15.392	19.372	21.620
Deductions						
TOTAL POINTS GAINED FOR MILK	14.62	26.89	20.14	15.39	19.37	21.62
Points for time since Kidging	1.9	3.3	1.9	2.4	3.2	3.1
TOTAL POINTS GAINED	16.52	30.19	22.04	17.79	22.57	24.72
Remarks and Awards		3rd Prize.	Highly Commended.		Highly Commended.	Highly Commended.

CLASS 41.—SHE GOATS (QUALIFIED AS "STAR OR 'Q' STAR MILKERS")—Continued.

Number Name ...	364 Play of Bashley.	365 Proverb of Bashley.	369 Didgenere Dixie.
Born ...	April 26, 1924.	Mar. 11, 1925.	May 19, 1925.
Live weight, in lbs. ...	187	190	186
Last Kiddeed ...	Feb. 11,	Jan. 29.	Mar. 8.
Days since Kiddeed ...	255-	268	229
Weight of Milk, 1st day ...	Morn. Even.	Morn. Even.	Born. Even.
Weight of Milk, 2nd day ...	5.8 5.4 5.1 6.1	5.0 4.9 4.8 5.1	7.0 6.2 6.5 5.6
Total ...	10.9 11.5	9.8 10.0	13.5 11.8
Average ...	5.45 5.75	4.9 5.0	6.75 5.9
Percentage (Fat ...	5.59 5.53	5.74 5.63	4.69 4.44
Composition of Solids other than Fat ...	8.73 9.07	8.88 9.07	8.65 8.73
the Milk. Total Solids ...	14.32 14.60	14.62 14.70	13.34 13.28
Actual weight of Fat, in lbs. ...	0.305 0.318	0.282 0.282	0.317 0.262
Calculation of Points multiply by 20 ...	6.10 6.36	5.64 5.64	6.34 5.24
Actual weight of Solids other than Fat, in lbs. ...	0.476 0.52	0.435 0.453	0.585 0.517
Calculation of Points multiply by 4 ...	1.904 2.08	1.740 1.812	2.540 2.068
Points—			
For weight of Milk (lbs.) ...	11.200	9.900	12.650
For weight of Fat (lbs. × 20) ...	12.460	11.280	11.580
For weight of Solids other than Fat (lbs. × 4) ...	3.984	3.552	4.408
Total Points for Milk ...	27.644	24.732	28.638
Deductions ...	—	—	—
TOTAL POINTS GAINED FOR MILK ...	27.64	24.73	28.63
Points for time since Kiddeed ...	3.5	3.7	3.1
TOTAL POINTS GAINED ...	31.14	28.43	31.73
Remarks and Awards ...	2nd Prize.	Reserve.	1st Prize.

CLASS 42.—SHE GOATS (NOT ELIGIBLE FOR CLASS 41).

Number Name ...	...	...	...	...	...	347 Riding Cilla.	348 Sandhill Nerine.	349 Leazes Saleswoman.
Born ...	...	...	...	...	...	June 3, 1926. 113	Feb. 25, 1924. 126	April 17, 1920. 116
Live weight, in lbs. ...	...	...	...	...	...	May 27. 149	Mar. 8. 220	Mar. 3. 234
Last KidDED ...	...	...	...	...	...
Days since KidDing ...	...	...	...	...	...	Morn. Even. 3-4 3-5 3-5 3-5	Morn. Even. 4-3 4-2 4-2 4-0	Morn. Even. 3-0 2-0 3-1 2-8
Weight of Milk, 1st day ...	...	...	...	...	...	6-9 7-0	8-5 8-2	6-1 5-7
Weight of Milk, 2nd day ...	...	...	...	...	...	3-45 3-5	4-25 4-1	3-05 2-85
Total ...	...	...	...	...	...	4-40 3-80 8-54 8-25 12-04 12-24	3-44 3-68 8-50 8-54 11-94 12-22	5-18 3-83 8-84 8-85 14-02 12-68
Average ...	...	...	...	...	...	0-152 0-136	0-146 0-152	0-158 0-100
Percentage { Fat Composition of { Solids other than Fat ...	...	...	...	...	...	3-04 2-72	2-92 3-04	3-16 2-18
Actual weight of Fat, in lbs. ...	...	...	...	...	...	0-294 0-292	0-362 0-350	0-270 0-252
Calculation of Points multiply by 20 ...	...	...	...	...	...	1-176 1-168	1-448 1-40	1-080 1-008
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	8-050 5-700 2-344	8-350 5-080 2-848	5-000 5-340 2-068
Calculation of Points multiply by 4 ...	...	...	...	...	...	15-054	17-158	13-328
For weight of Milk (lbs.) ...	...	...	...	...	...	—	—	—
For weight of Fat (lbs. × 20) ...	...	...	...	...	...	15-05	17-15	13-82
For weight of Solids other than Fat (lbs. × 4) ...	...	...	...	...	...	1-7	3-1	3-2
Total Points for Milk ...	...	...	...	...	...	16-75	20-26	16-53
Deductions ...	...	...	...	...	...	2nd Prize.	1st Prize.	3rd Prize.
TOTAL POINTS GAINED FOR MILK ...	...	...	...	...	...
Points for time since KidDing ...	...	...	...	...	...
TOTAL POINTS GAINED ...	...	...	...	...	...
Remarks and Awards ...	...	...	...	...	...

THE DAIRY SHOW BUTTER TESTS OF 1928.

By R. H. EVANS, B.Sc.

In October, 1927, the Agricultural Hall happened to be within an infected area under the foot and mouth disease orders and regulations, and, consequently, it was not possible to carry out the Butter Tests—which have always been such a prominent feature at the London Dairy Show. Those responsible for the Show arrangements were, therefore, somewhat afraid that the cancelling of these classes at the 1927 Show might materially diminish the number of entries at the 1928 Show. The fact that there were fewer entries in 1928 may be partly due to the above cause, but the entries were not affected to the extent it had once been anticipated.

The Prizes in the Butter Tests were awarded to the following scale of points :—

One point for every ounce of butter : one point for every completed 10 days since calving (calculated to the first day of the Show), deducting the first 40 days. Maximum allowance for period of lactation, 12 points.

Fraction of ounces of butter, and incomplete periods of less than 10 days to be worked out in decimals, and added to the total points.

In the case of cows obtaining the same number of points, the prize to be awarded to the cow that has been longest time in milk.

A certificate, giving the last day of calving (which must be before 9 a.m., on October 9th), must reach the Secretary by Saturday, October 13th.

No prize will be awarded to animals in the Butter Tests which do not come up to the following standard :—

Breed.	Cows under 5 years.	Cows 5 years and over.
	Points.	Points.
Pedigree Shorthorns	30	34
Non-Pedigree Shorthorns	30	34
British Friesians	30	34
Lincolnshire Red Shorthorns	30	34
Jerseys	30	35
Guernseys	27	30
Ayrshires	27	30
Red Polls	30	34
South Devons	30	34
Kerries	26	29
Dexters	26	29
Devons	27	30
Welsh Blacks	27	30
Blue Albions	30	34

Certificates of Merit and Highly Commended Cards will be given to animals, other than prize-winners, that reach the above standard.

The total number of entries and the actual number tested at the 1928 Show :—

Breed.	Number Entered.	Number Tested.
Pedigree Shorthorns	23	13
Non-Pedigree Shorthorns	12	7
Lincolnshire Red Shorthorns	5	4
British Friesians	35	19
South Devons	3	2
Dairy South Devons	7	5
Devons	2	2
Red Polls	24	17
Blue Albions	1	—
Welsh Blacks	2	—
Ayrshires	37	25
Guernseys	13	10
Jerseys	20	22
Kerries	3	2
Dexters	6	5
	202	133

SHORTHORNS.

The number of Shorthorns—including pedigree, non-pedigree and Lincolnshire Reds—entered for the Butter Tests has of late years shown a decided decrease, as is shown by the following figures. In 1921 as many as 70 Shorthorns competed; in 1922 the number had fallen to 46; 43 in 1923; 26 in 1924; 25 in 1925; 27 in 1926; and the number tested at the 1928 Show was 24. Several reasons might be put forward to account for this decrease in numbers, but it is a matter of regret that this breed—which, since the tests were initiated, has held the premier position—should have to take the third or fourth place as far as numbers are concerned. Of the 24 cows tested in 1928, 13 were pedigree animals, seven non-pedigree, and the remaining four were Lincolnshire Reds. The total amount of butter yielded by the 24 cows tested amounted to 34 lbs. 6 $\frac{3}{4}$ ozs., showing the average of only 1 lb. 6 $\frac{3}{4}$ ozs. per animal, the lowest figure for some years.

The average weight of butter for the 13 pedigree animals amounted to 1 lb. 4 $\frac{1}{4}$ ozs.; for the seven non-pedigree cattle, 1 lb. 5 $\frac{1}{2}$ ozs., and for the four Lincolnshire Reds, 2 lbs. 2 ozs.

The Premier Prize in this class was awarded to Mr. Jno. Evens' "Burton Red Rose 6th," with a yield of 2 lbs. 15 $\frac{1}{2}$ ozs. butter, obtained from 73 lbs. milk. Mr. A. R. Fish's "Lady Coral" was second, with a yield of 2 lbs. 5 $\frac{1}{4}$ ozs., her milk yield being 53 lbs. 5 ozs. The Third Prize went to Mr. J. H. Robinson's "Dora," which gave 2 lbs. 2 ozs. of butter from 45 lbs. 4 ozs. milk. Mr. Ralph Tustian's "Great Tew Sophia" occupied the fourth position, with a yield of 1 lb. 9 ozs., having been 117 days in milk. Of the 24 Shorthorns tested, the above four animals were the only cows to obtain the standard of points for the breed.

BRITISH FRIESIANS.

Nineteen British Friesians were tested at the 1928 Show—six less than at the previous Show. Their performance was not quite up to the standard obtaining in 1926. The average yield of butter in the class was 1 lb. 14 ozs., as compared with 2 lbs. 4½ ozs. at the 1926 Show, with a butter ratio of 1 : 33·45, as compared with 1 : 28·97.

The First Prize was awarded to Lord Raleigh's cow "Terling Unique," her yield of milk and butter for the 24 hours amounting to 72 lbs. 15 ozs. and 3 lbs. 10¼ ozs. respectively, and a butter ratio of 1 : 20·1—a very creditable performance. The Second Prize went to Miss E. Martin Smith's "Sudbourne Flossiewijk," which yielded 87 lbs. 4 ozs. milk and 3 lbs. 5¾ ozs. butter.

It is interesting to note that both these animals are from a common sire, viz., "Terling (imp) Vic Brutus." The third place of honour was occupied by Mr. Hubert M. Martineau's "Holyport Unity," with a yield of 87 lbs. 5 ozs. milk and 3 lbs. 2 ozs. butter. Mr. Thomas Brown's "Haslington Frisky" was awarded the Fourth Prize, her butter amounting to 2 lbs. 10¼ ozs. obtained from 75 lbs. 15 ozs. milk.

SOUTH DEVONS.

Two cows competed in this class. A prize was awarded to Mr. George Will's "Milkmaid 14th." She produced 70 lbs. 10 ozs. of milk, from which 2 lbs. 14 ozs. of butter was obtained.

DAIRY SOUTH DEVONS.

There were five entries in this class, and of this number only one failed to reach the standard for the breed. The Seale Hayne Agricultural College cow, "Foreman 3rd," gave the highest yield of butter of any cow at the 1928 Show, her yield in the 24 hours being 3 lbs. 12¾ ozs. from 57 lbs. of milk, after having calved 179 days—quite an outstanding performance. This animal was awarded the National Butter Cup—the first animal other than a Jersey to win this cup.

Mr. Peter Cock's "Alice 50th" was the reserve for the prize offered, her yield of milk and butter being 55 lb. 10 ozs. and 3 lbs., respectively.

DEVONS.

Two Devon cows were tested and both reached the standard of points for the breed. Major H. B. Nicholson, D.S.O., "Wraxall Darling 3rd," was awarded the prize of £3, having yielded 1 lb. 3 ozs. of butter 244 days after calving.

RED POLLS.

Seventeen Red Polls were tested, ten of which number obtained the standard of points for the breed. The premier award went to Mr. A. Preston Jones' "Upton Minnow," with a yield of 3 lbs. 0½ oz. butter obtained from 51 lbs. 2 ozs. milk—a ratio of 1 : 16·9. Major J. A. Morrison, D.S.O., was second with "Basildon Russett," her yield of

butter amounting to 2 lbs. 9 $\frac{3}{4}$ ozs. Major Morrison's cow "Basildon Rosalind 3rd" was third, with a yield of 2 lbs. 3 $\frac{1}{2}$ ozs. The performance of this breed showed a decided improvement on the results obtained in 1926.

AYRSHIRES.

The number of Ayrshires tested was one less than at the 1926 Show. Of the 25 animals competing 19—or 76 per cent.—obtained the standard of points for the breed. Seventy-two per cent. of the animals of this breed competing yielded over 2 lbs. of butter in the 24 hours. The average performance of the Ayrshires at the 1928 Show was, however, slightly below that obtaining at the 1926 Show.

Mr. John H. Drummond's cow "Bargower Eva" was awarded the First Prize, with a yield of 3 $\frac{1}{2}$ lbs. of butter in the 24 hours. This was obtained from 79 lbs. 12 ozs. milk, her butter ratio being 1 : 22·7. Messrs. Jones and Watson's cow "Harleyholm Jenny 3rd" was second, with a yield of 3 lbs. 3 $\frac{3}{4}$ ozs. butter from 87 lbs. 3 ozs. milk. The third award went to Lt.-Col. R. E. Cecil, D.S.O., "Eglinton Mains Blossom," with a yield of 2 lbs. 15 $\frac{3}{4}$ ozs. butter.

The average performance of the animals competing in this class was, as usual, of a high standard.

GUERNSEYS.

Ten Guernseys competed as against 14 in 1926. The prize of £3 was awarded to Mr. A. Chester Beatty's "Calehill Dewdrop," with a yield of 2 lbs. 3 $\frac{3}{4}$ ozs. butter, having calved 143 days, thus obtaining 10·3 points for lactation. Lord Rennant's "Southern Starrette" won the Second Prize with a yield of 2 lb. 10 $\frac{1}{2}$ ozs., but her lactation points amounted to only 0·3. Fifty per cent. of the Guernseys tested yielded above 2 lbs. of butter each.

JERSEYS.

Twenty-two Jerseys were tested in 1928, as against 25 in 1926. Sixteen of the 25 yielded over 2 lbs. of butter each in the 24 hours.

Capt. F. B. Imbert-Terry, M.C., "Blue Hayes Noble Star," was awarded premier honours in this class, her yield of butter amounting to 2 lbs. 13 $\frac{3}{4}$ ozs., to which was added 10·7 points for lactation. Mr. H. Cecil Pelly's "Sixty Five" carried off the second award with a yield of 3 lbs. 6 ozs., butter, but she only received 0·7 points for lactation. Mr. Cortlandt Taylor's "Ulrica's Love" occupied the third position, with 2 lbs. 9 $\frac{3}{4}$ ozs. butter and 11 points for lactation. Only one cow out of the 22 tested failed to reach the standard for the breed. Mr. Grosvenor Berry's "Nimrod's Primrose" was the reserve cow for the National Butter Cup.

KERRIES.

Two cows of this breed competed, and both failed to reach the standard of points for the breed.

DEXTERS.

Five Dexters competed, the award of £3 being awarded to Lady Loder's "Grinstead Taxus," her butter yield amounting to 1 lb. 15 $\frac{3}{4}$ ozs., to which was added 1.5 points for lactation.

THRICE AND TWICE MILKERS.

The 1928 Show was the second at which exhibitors had the choice of having their cows milked either twice or thrice daily. Of the 133 animals tested 92 were milked three times a day, and the remainder only twice. Of the 23 prizes awarded in the Butter Tests Section, 16 were won by thrice milkers and the remaining seven by twice milkers.

TROPHIES AND CUPS.

In awarding the following Trophies and Cups, the Butter Test points were taken into consideration:—

THE B.D.F.A. SUPREME INDIVIDUAL CHAMPIONSHIP.

				Winner No.	Res. No.
Challenge Trophy	...	...	...	244	164
Morrison Challenge Trophy	...	...	...	109	—
Spencer Cup	...	...	...	164	244
National Butter Cup	...	...	...	164	296
Shorthorn Butter Cup	...	...	...	3	42
South Devon Herd Book Cup	...	...	...	161	—
Dairy South Devon Cup	...	...	...	164	170
Busk Challenge Cup	...	...	...	No award.	
Rowallan Cup	...	...	...	244	225
Stagenhoe Cup	...	...	...	265	266
Nutt Cup	...	...	...	338	340

My best thanks are due to my colleague Mr. J. G. W. Stafford and others who rendered valuable assistance in the carrying out of the tests.

The following table gives the average results for all breeds competing:—

Year.				Total No. of Cows.	Average weight of 24 hours' Milk.	Average Yield of Butter.	Average Butter Ratio.	Average No. of Points.
					lbs.	ozs.		
1919	...	...	...	94	37 $\frac{1}{2}$	1 9 $\frac{1}{2}$	23.43	28.61
1920	...	...	...	111	39	1 9 $\frac{1}{2}$	24.21	28.25
1921	...	...	...	173	39 $\frac{1}{2}$	1 6 $\frac{1}{2}$	25.35	27.68
1922	...	...	...	187	42 $\frac{1}{2}$	1 8 $\frac{1}{2}$	27.99	26.31
1923	...	...	...	143	41 $\frac{1}{2}$	1 11 $\frac{1}{2}$	24.03	32.23
1924	...	...	...	148	43 $\frac{1}{2}$	1 12 $\frac{1}{2}$	24.21	32.55
1925	...	...	...	154	46 $\frac{1}{2}$	1 13 $\frac{1}{2}$	25.59	32.61
1926	...	...	...	149	49 $\frac{1}{2}$	1 15 $\frac{1}{2}$	26.69	34.68
1928	...	...	...	133	49 $\frac{1}{2}$	1 14 $\frac{1}{2}$	27.00	33.93

TABLE I.—NUMBER OF CATTLE TESTED SINCE 1901.

Breed	1901 to 1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1919	1920	1921	1922	1923	1924	1925	1926	1928
Shorthorns	78	17	22	26	26	19	22	26	30	26	20	20	24	30	63	39	34	18	15	23	20
Lincoln Reds	—	—	—	7	9	8	8	6	6	5	4	2	4	4	7	7	9	8	10	4	4
British Friesians	—	—	—	—	—	—	—	—	—	—	1	2	2	15	10	24	13	23	19	25	19
South Devons	4	3	5	—	—	4	7	2	4	2	6	3	—	—	5	5	3	—	2	1	2
Dairy South Devons	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	5
Devons	—	—	—	—	—	—	—	—	—	—	—	—	5	2	6	7	5	3	8	1	2
Red Polls	17	11	12	11	3	4	4	1	1	—	—	1	11	12	17	23	13	17	6	17	17
Blue Albions	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	5	4	—
Welsh Blacks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	2	1	—
Ayrshires	3	3	2	—	4	—	1	—	4	—	—	—	—	—	2	20	16	15	31	26	25
Guernseys	17	3	2	2	2	2	2	1	2	6	5	7	16	14	19	15	10	16	18	14	10
Jerseys	87	18	13	13	16	22	18	18	7	18	9	10	22	21	24	27	25	32	24	25	22
Kerries	—	1	2	2	2	2	—	1	—	5	—	—	4	8	17	13	7	10	7	5	2
Dexters	5	—	—	—	3	—	—	—	—	—	—	—	6	5	3	3	8	2	3	3	5
Three-Times Milkers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—
Cross-Breds	27	8	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dutch	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTALS	289	64	68	61	65	61	62	55	54	62	45	45	94	111	173	187	143	148	154	149	133

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1919, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS.

Year.	No.	Breed.	Average No. of Days in Milk.	Average Weight of Butter.	Average Butter Ratio.	Average No. of Points.
				lbs. ozs.	lbs.	
1919 ...	24	Shorthorns ...	34	1 13 $\frac{1}{2}$	24.35	28.82
1920 ...	30	" ...	34	1 11 $\frac{1}{2}$	25.43	27.91
1921 ...	63	" ...	29	1 8	30.25	24.20
1922 ...	39	" ...	30	1 9	30.75	25.68
1923 ...	34	" ...	57	1 14 $\frac{1}{2}$	26.01	32.59
1924 ...	18	" ...	34 $\frac{1}{2}$	1 15	25.54	31.95
1925 ...	15	" ...	40	1 11 $\frac{1}{2}$	27.60	28.46
1926 ...	23	" ...	43	1 13 $\frac{1}{2}$	27.05	31.01
1928 ...	20	" ...	60	1 4 $\frac{1}{2}$	34.12	23.13
1919 ...	4	Lincoln Reds ...	58	1 13 $\frac{1}{2}$	29.20	32.32
1920 ...	4	" ...	59	1 5 $\frac{1}{2}$	31.61	23.90
1921 ...	7	" ...	64	1 13 $\frac{1}{2}$	27.13	31.40
1922 ...	7	" ...	31 $\frac{1}{2}$	2 3 $\frac{1}{2}$	24.82	35.89
1923 ...	9	" ...	58	1 14 $\frac{1}{2}$	26.37	32.73
1924 ...	8	" ...	72 $\frac{1}{2}$	1 12	27.43	32.11
1925 ...	10	" ...	39	2 1 $\frac{1}{2}$	27.27	34.27
1926 ...	4	" ...	31	2 8 $\frac{1}{2}$	22.57	40.66
1928 ...	4	" ...	33	2 2	29.76	34.06
1919 ...	2	British Friesians ...	28	1 10 $\frac{1}{2}$	36.05	26.50
1920 ...	15	" ...	50	1 13	29.59	31.17
1921 ...	10	" ...	85	2 3	28.26	39.00
1922 ...	24	" ...	57	1 10	35.32	26.86
1923 ...	13	" ...	65	1 11 $\frac{1}{2}$	32.22	31.76
1924 ...	23	" ...	57 $\frac{1}{2}$	1 12	31.87	30.28
1925 ...	19	" ...	45	1 15	32.36	32.50
1926 ...	25	" ...	52	2 4 $\frac{1}{2}$	28.97	38.13
1928 ...	19	" ...	52	1 14	33.45	31.74
1921 ...	5	South Devons ...	77	1 14 $\frac{1}{2}$	22.06	34.42
1922 ...	5	" ...	55	1 13	27.04	29.25
1923 ...	3	" ...	36	2 3 $\frac{1}{2}$	21.43	35.76
1925 ...	2	" ...	111	2 8 $\frac{1}{2}$	17.80	46.25
1926 ...	1	" ...	88	3 2 $\frac{1}{2}$	21.63	55.30
1928 ...	2	" ...	54	2 3 $\frac{1}{2}$	25.67	37.40
1925 ...	1	Dairy South Devon ...	124	2 4 $\frac{1}{2}$	18.90	44.90
1928 ...	5	" ...	116	2 8 $\frac{1}{2}$	19.41	47.78
1919 ...	5	Devons ...	60	1 9 $\frac{1}{2}$	24.47	27.57
1920 ...	2	" ...	25	1 15 $\frac{1}{2}$	19.32	31.55
1921 ...	6	" ...	48	1 15	21.92	32.60
1922 ...	7	" ...	47 $\frac{1}{2}$	1 10 $\frac{1}{2}$	27.00	28.53
1923 ...	5	" ...	41	1 14 $\frac{1}{2}$	23.18	31.29
1924 ...	3	" ...	40 $\frac{1}{2}$	1 10 $\frac{1}{2}$	24.88	26.50
1925 ...	8	" ...	51	1 13 $\frac{1}{2}$	24.40	30.78
1926 ...	1	" ...	41	2 3 $\frac{1}{2}$	21.85	35.85
1928 ...	2	" ...	213	1 2	22.55	30.00
1919 ...	11	Red Polls ...	49	1 8 $\frac{1}{2}$	30.03	26.02
1920 ...	12	" ...	61	1 5 $\frac{1}{2}$	31.46	23.66
1921 ...	17	" ...	68	1 9 $\frac{1}{2}$	24.73	27.52
1922 ...	23	" ...	59	1 3 $\frac{1}{2}$	34.09	21.75
1923 ...	13	" ...	57	1 9 $\frac{1}{2}$	26.67	28.00
1924 ...	17	" ...	76 $\frac{1}{2}$	1 7 $\frac{1}{2}$	25.79	24.96
1925 ...	6	" ...	63	1 11 $\frac{1}{2}$	28.70	30.20
1926 ...	17	" ...	60	1 11	27.13	29.47
1928 ...	17	" ...	67	1 13 $\frac{1}{2}$	28.24	32.21

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1919, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS—*Continued.*

Year.	No.	Breed.	Average No. of Days in Milk.	Average Weight of Butter.	Average Butter Ratio.	Average No. of Points.
1924 ...	4	Blue Albions ...	261 $\frac{1}{2}$	lbs. ozs. 1 15 $\frac{1}{2}$	lbs. 23.34	31.63
1925 ...	5	" ...	35	2 0 $\frac{1}{2}$	28.70	33.11
1926 ...	4	" ...	50	1 14 $\frac{1}{2}$	31.16	32.16
1922 ...	4	Welsh Blacks ...	52	1 13 $\frac{1}{2}$	24.23	30.45
1925 ...	2	" ...	42	1 15 $\frac{1}{2}$	21.60	31.62
1926 ...	1	" ...	43	1 10 $\frac{1}{2}$	26.72	27.05
1921 ...	2	Ayrshires ...	39	2 5	20.15	37.20
1922 ...	20	" ...	32 $\frac{1}{2}$	1 10 $\frac{1}{2}$	31.92	32.18
1923 ...	16	" ...	29	1 14	23.88	30.35
1924 ...	15	" ...	27	2 0 $\frac{1}{2}$	22.65	32.40
1925 ...	31	" ...	33	1 14 $\frac{1}{2}$	26.00	31.60
1926 ...	26	" ...	35	2 3 $\frac{1}{2}$	24.66	36.61
1928 ...	25	" ...	36	2 3 $\frac{1}{2}$	25.69	36.38
1919 ...	16	Guernseys ...	80	1 7 $\frac{3}{4}$	19.76	27.16
1920 ...	14	" ...	82	1 8 $\frac{1}{2}$	21.22	28.53
1921 ...	19	" ...	82	1 8 $\frac{1}{2}$	20.45	27.47
1922 ...	15	" ...	52	1 8 $\frac{3}{4}$	21.95	27.31
1923 ...	10	" ...	66	1 10 $\frac{3}{4}$	22.89	30.13
1924 ...	16	" ...	84	1 9	22.30	29.08
1925 ...	18	" ...	100	1 8	22.10	29.41
1926 ...	14	" ...	100	1 11	21.99	32.73
1928 ...	10	" ...	110	1 13 $\frac{1}{2}$	21.75	35.34
1919 ...	22	Jerseys ...	111	1 11 $\frac{1}{2}$	18.76	33.59
1920 ...	21	" ...	106	1 11	18.85	32.74
1921 ...	24	" ...	127	1 9 $\frac{1}{2}$	18.56	32.29
1922 ...	27	" ...	105	1 9 $\frac{1}{2}$	19.82	31.90
1923 ...	25	" ...	135	1 10	18.49	35.31
1924 ...	32	" ...	132	1 15 $\frac{1}{2}$	17.75	38.11
1925 ...	24	" ...	135	1 13 $\frac{1}{2}$	18.61	38.60
1926 ...	25	" ...	126	1 14	19.39	37.61
1928 ...	22	" ...	136	2 2 $\frac{1}{2}$	17.99	43.50
1919 ...	4	Kerries ...	32	1 2 $\frac{1}{2}$	27.66	18.71
1920 ...	8	" ...	63	1 7	22.81	25.77
1921 ...	17	" ...	76	1 3 $\frac{1}{2}$	23.16	22.43
1922 ...	13	" ...	51	1 1 $\frac{1}{2}$	29.33	19.34
1923 ...	7	" ...	156	1 8 $\frac{1}{2}$	24.60	29.74
1924 ...	10	" ...	82	1 5	26.90	24.42
1925 ...	7	" ...	68	1 15 $\frac{1}{2}$	24.58	34.65
1926 ...	5	" ...	39	1 10 $\frac{1}{2}$	25.13	26.82
1928 ...	2	" ...	63	1 2 $\frac{1}{2}$	32.84	21.50
1919 ...	6	Dexters ...	129	0 15 $\frac{1}{2}$	23.48	23.84
1920 ...	5	" ...	112	0 12 $\frac{1}{2}$	21.78	19.21
1921 ...	3	" ...	153	0 11	24.33	22.30
1922 ...	3	" ...	143	0 13 $\frac{1}{2}$	25.82	21.73
1923 ...	8	" ...	150	0 13 $\frac{1}{2}$	25.20	23.56
1924 ...	2	" ...	78	1 7 $\frac{1}{2}$	23.01	20.85
1925 ...	3	" ...	118	1 5 $\frac{1}{2}$	25.40	29.22
1926 ...	3	" ...	102	1 4 $\frac{1}{2}$	27.97	25.56
1928 ...	5	" ...	79	1 5 $\frac{1}{2}$	25.49	25.55

TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT BREEDS AT DIFFERENT PERIODS.

Year.	Breed.	No. of Cows.	Days in Milk, 50.	No. of Cows.	Days in Milk, 100.	No. of Cows.	Days in Milk, 135.	No. of Cows.	Days in Milk, 190.
			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1919	Shorthorns	20	1 13 $\frac{1}{2}$	4	1 12 $\frac{1}{2}$	—	—	—	—
1920	"	25	1 12 $\frac{1}{2}$	5	1 6 $\frac{1}{2}$	—	—	—	—
1921	"	56	1 8 $\frac{1}{2}$	5	1 5 $\frac{1}{2}$	—	—	—	—
1922	"	33	1 9	5	1 4 $\frac{1}{2}$	1	0 1 $\frac{1}{2}$	—	—
1923	"	24	1 15 $\frac{1}{2}$	4	2 0 $\frac{1}{2}$	2	1 13	4	1 5
1924	"	16	2 0	1	1 3 $\frac{1}{2}$	—	—	1	1 11
1925	"	12	1 12 $\frac{3}{4}$	2	0 15 $\frac{3}{4}$	—	—	1	2 3 $\frac{3}{4}$
1926	"	17	1 15 $\frac{3}{4}$	5	1 9 $\frac{1}{2}$	—	—	1	1 3
1928	"	9	1 5 $\frac{1}{2}$	6	1 6 $\frac{1}{2}$	5	1 1 $\frac{1}{2}$	—	—
1919	Lincoln Reds	2	1 14 $\frac{1}{2}$	1	2 3 $\frac{1}{2}$	1	1 6 $\frac{1}{2}$	—	—
1920	"	2	1 8 $\frac{1}{2}$	2	1 2 $\frac{1}{2}$	—	—	—	—
1921	"	4	1 14 $\frac{1}{2}$	1	1 10 $\frac{1}{2}$	2	1 11 $\frac{1}{2}$	—	—
1922	"	7	2 3 $\frac{3}{4}$	—	—	—	—	—	—
1923	"	5	1 12 $\frac{3}{4}$	2	1 10	—	—	2	1 8
1924	"	5	1 12 $\frac{3}{4}$	—	—	2	1 8 $\frac{1}{2}$	1	2 1
1925	"	8	2 2	2	1 14 $\frac{1}{2}$	—	—	—	—
1926	"	4	2 8 $\frac{1}{2}$	—	—	—	—	—	—
1928	"	4	2 2	—	—	—	—	—	—
1919	British Friesians	2	1 10 $\frac{1}{2}$	—	—	—	—	—	—
1920	"	10	1 12 $\frac{1}{2}$	3	1 11 $\frac{1}{2}$	2	2 2 $\frac{1}{2}$	—	—
1921	"	3	2 3 $\frac{1}{2}$	2	1 14	3	2 6 $\frac{1}{2}$	2	2 1 $\frac{1}{2}$
1922	"	17	1 11 $\frac{1}{2}$	3	1 12 $\frac{3}{4}$	2	1 0 $\frac{3}{4}$	2	1 0 $\frac{3}{4}$
1923	"	6	1 7 $\frac{1}{4}$	4	2 0 $\frac{3}{4}$	1	2 4 $\frac{1}{2}$	2	1 13 $\frac{3}{4}$
1924	"	14	2 0	7	1 6 $\frac{1}{2}$	—	—	2	1 3 $\frac{3}{4}$
1925	"	13	1 14	5	2 0 $\frac{3}{4}$	1	2 5 $\frac{1}{2}$	—	—
1926	"	15	2 4 $\frac{1}{2}$	6	2 3 $\frac{1}{2}$	3	1 8 $\frac{1}{2}$	1	2 4 $\frac{1}{2}$
1928	"	13	1 15	3	2 2 $\frac{1}{2}$	3	1 4 $\frac{1}{2}$	—	—
1921	South Devons	1	2 6	3	1 8 $\frac{1}{2}$	—	—	1	2 7
1922	"	2	2 2 $\frac{3}{4}$	3	1 10 $\frac{1}{4}$	—	—	—	—
1923	"	2	2 5 $\frac{1}{2}$	1	1 15	—	—	—	—
1925	"	1	3 2 $\frac{3}{4}$	—	—	—	—	1	1 13 $\frac{3}{4}$
1926	"	—	—	1	3 2 $\frac{1}{2}$	—	—	—	—
1928	"	1	2 14	1	1 9	—	—	—	—
1925	Dairy S'th Devon	—	—	—	—	1	2 4 $\frac{1}{2}$	—	—
1928	"	—	—	1	2 6 $\frac{1}{2}$	3	2 2 $\frac{1}{2}$	1	3 12 $\frac{1}{2}$
1919	Devons	2	1 15 $\frac{1}{2}$	2	1 6 $\frac{1}{2}$	1	1 3	—	—
1920	"	2	1 15 $\frac{1}{2}$	—	—	—	—	—	—
1921	"	5	2 0 $\frac{1}{2}$	—	—	—	—	1	1 6
1922	"	6	1 12 $\frac{3}{4}$	—	—	—	—	1	0 14 $\frac{1}{2}$
1923	"	3	1 13 $\frac{1}{2}$	2	1 15 $\frac{1}{2}$	—	—	—	—
1924	"	3	1 10 $\frac{1}{2}$	—	—	—	—	—	—
1925	"	7	1 15	—	—	—	—	—	—
1926	"	1	2 3 $\frac{3}{4}$	—	—	—	—	—	—
1928	"	—	—	—	—	—	—	1	1 1
1919	Red Polls	6	1 10	5	1 6 $\frac{1}{2}$	—	—	—	—
1920	"	8	1 7 $\frac{1}{2}$	2	1 2	1	0 15 $\frac{1}{2}$	1	1 2
1921	"	7	1 12 $\frac{1}{2}$	6	1 9 $\frac{1}{2}$	2	1 9 $\frac{1}{2}$	2	1 7 $\frac{1}{2}$
1922	"	13	1 2 $\frac{3}{4}$	7	1 4	2	1 1 $\frac{1}{2}$	1	0 15
1923	"	7	1 8 $\frac{1}{2}$	4	1 6 $\frac{1}{2}$	1	2 4 $\frac{1}{2}$	1	2 2 $\frac{1}{2}$
1924	"	10	1 10	2	1 4	1	1 7 $\frac{1}{2}$	4	1 3 $\frac{3}{4}$
1925	"	6	1 14 $\frac{1}{2}$	1	1 10 $\frac{1}{2}$	—	—	1	1 10 $\frac{1}{2}$
1926	"	10	1 10 $\frac{1}{2}$	4	1 11 $\frac{1}{2}$	2	1 13 $\frac{1}{2}$	1	1 9
1928	"	7	1 13	7	1 13	2	1 15 $\frac{1}{2}$	1	1 13

TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT BREEDS AT DIFFERENT PERIODS—*Continued.*

Year.	Breed.	No. of Cows.	Days in Milk, 50.	No. of Cows.	Days in Milk, 100.	No. of Cows.	Days in Milk, 135.	No. of Cows.	Days in Milk, 190.
			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1924	Blue Albions	3	1 15 $\frac{1}{2}$	1	1 15	—	—	—	—
1925	"	4	2 3	1	1 8	—	—	—	—
1926	"	3	1 14 $\frac{1}{2}$	—	—	1	1 12 $\frac{1}{2}$	—	—
1922	Welsh Blacks	2	1 14 $\frac{1}{2}$	2	1 4 $\frac{1}{2}$	—	—	—	—
1925	"	2	1 15 $\frac{1}{2}$	—	—	—	—	—	—
1926	"	1	1 10 $\frac{1}{2}$	—	—	—	—	—	—
1921	Ayrshires	2	2 5	—	—	—	—	—	—
1922	"	16	1 7 $\frac{3}{4}$	3	1 2 $\frac{3}{4}$	—	—	1	1 2 $\frac{3}{4}$
1923	"	14	1 15	2	1 8 $\frac{1}{2}$	—	—	—	—
1924	"	15	2 0 $\frac{1}{2}$	—	—	—	—	—	—
1925	"	27	1 14 $\frac{1}{2}$	4	1 14 $\frac{1}{2}$	—	—	—	—
1926	"	21	2 3 $\frac{3}{4}$	4	2 4 $\frac{1}{2}$	1	2 7 $\frac{1}{2}$	—	—
1928	"	21	2 4 $\frac{1}{2}$	3	1 13 $\frac{1}{2}$	1	2 0 $\frac{1}{2}$	—	—
1919	Guernseys	8	1 8 $\frac{1}{2}$	2	1 11	2	1 2 $\frac{1}{2}$	4	1 7 $\frac{1}{2}$
1920	"	4	1 10	5	1 11 $\frac{1}{2}$	3	1 2 $\frac{1}{2}$	1	1 2
1921	"	7	1 12	5	1 5	2	1 7 $\frac{1}{2}$	5	1 7
1922	"	9	1 8 $\frac{1}{2}$	3	1 12	1	1 5 $\frac{1}{2}$	2	1 7
1923	"	5	1 10 $\frac{1}{2}$	2	1 11 $\frac{1}{2}$	1	2 1 $\frac{1}{2}$	2	1 7 $\frac{1}{2}$
1924	"	8	1 8 $\frac{1}{2}$	2	1 9 $\frac{1}{2}$	3	1 6 $\frac{1}{2}$	3	1 10 $\frac{1}{2}$
1925	"	6	1 7 $\frac{1}{2}$	2	1 5 $\frac{1}{2}$	3	1 10	2	1 8 $\frac{1}{2}$
1926	"	2	2 6 $\frac{1}{2}$	5	1 5 $\frac{1}{2}$	4	1 13 $\frac{1}{2}$	2	1 8
1928	"	3	1 14 $\frac{1}{2}$	3	2 0 $\frac{1}{2}$	1	1 11	1	2 3 $\frac{1}{2}$
1919	Jerseys	3	1 15 $\frac{1}{2}$	8	1 7 $\frac{1}{2}$	4	1 12 $\frac{1}{2}$	4	1 11 $\frac{1}{2}$
1920	"	6	1 13 $\frac{1}{2}$	4	1 11 $\frac{1}{2}$	3	1 14	6	1 5 $\frac{1}{2}$
1921	"	1	1 2 $\frac{1}{2}$	8	1 8 $\frac{1}{2}$	4	1 15	8	1 7 $\frac{1}{2}$
1922	"	4	1 12 $\frac{1}{2}$	8	1 11 $\frac{1}{2}$	7	1 8 $\frac{1}{2}$	8	1 6 $\frac{1}{2}$
1923	"	1	1 9 $\frac{1}{2}$	3	1 11 $\frac{1}{2}$	8	1 9 $\frac{1}{2}$	13	1 10 $\frac{1}{2}$
1924	"	2	1 10 $\frac{1}{2}$	6	1 11 $\frac{1}{2}$	7	1 15 $\frac{1}{2}$	17	1 14
1925	"	4	1 13 $\frac{1}{2}$	5	2 1 $\frac{1}{2}$	4	1 6	5	2 0 $\frac{1}{2}$
1926	"	2	2 0 $\frac{1}{2}$	7	1 11 $\frac{1}{2}$	7	1 12 $\frac{1}{2}$	7	1 15 $\frac{1}{2}$
1928	"	2	2 11 $\frac{1}{2}$	2	2 6 $\frac{1}{2}$	7	2 2 $\frac{1}{2}$	8	2 1 $\frac{1}{2}$
1922	Kerries	7	1 2 $\frac{1}{2}$	5	1 1	—	—	1	0 12
1923	"	3	1 12	1	1 8	1	1 10 $\frac{1}{2}$	2	1 2 $\frac{1}{2}$
1924	"	2	1 10 $\frac{1}{2}$	6	1 2 $\frac{1}{2}$	1	1 8 $\frac{1}{2}$	1	1 4
1925	"	5	2 3	—	—	—	—	2	1 5 $\frac{1}{2}$
1926	"	4	1 12 $\frac{1}{2}$	1	1 2 $\frac{1}{2}$	—	—	—	—
1928	"	1	0 15 $\frac{1}{2}$	—	—	1	1 5	—	—
1922	Dexters	1	0 12	2	0 13	—	—	—	—
1923	"	1	0 10	1	0 10	—	—	6	0 15
1924	"	1	0 13 $\frac{1}{2}$	—	—	1	1 2	—	—
1925	"	1	1 10 $\frac{1}{2}$	—	—	—	—	2	1 3 $\frac{1}{2}$
1926	"	1	1 2 $\frac{1}{2}$	1	1 3 $\frac{1}{2}$	—	—	1	1 6 $\frac{1}{2}$
1928	"	1	1 4	3	1 7 $\frac{1}{2}$	—	—	1	1 0 $\frac{1}{2}$

TABLE IV.—COMPARISON OF CHURNINGS WITH ANALYSES.

SHORTHORNS.

No. in Catalogue.	Weight of Butter Churned.		Total Fat by Analyses.		No. in Catalogue.	Weight of Butter Churned.		Total Fat by Analyses.	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
1	1	7 $\frac{1}{4}$	1	8	42	1	9	1	9 $\frac{1}{2}$
3	2	5 $\frac{1}{4}$	2	3 $\frac{1}{2}$	43	1	3 $\frac{3}{4}$	1	14
10	1	8	1	12	58	0	12 $\frac{3}{4}$	0	13 $\frac{1}{2}$
15	0	15	2	9 $\frac{1}{2}$	75	2	2	1	14
20	1	2 $\frac{1}{2}$	2	1 $\frac{1}{2}$	78	1	7	1	5 $\frac{1}{2}$
26	1	7 $\frac{1}{4}$	1	9 $\frac{1}{2}$	79	1	1 $\frac{1}{4}$	0	15 $\frac{1}{2}$
29	1	0 $\frac{1}{4}$	1	9	83	1	9	1	7 $\frac{1}{2}$
30	0	10	0	12 $\frac{1}{2}$	85	0	14 $\frac{1}{4}$	0	14 $\frac{1}{2}$
32	1	3 $\frac{1}{2}$	1	8 $\frac{1}{2}$	86	0	14 $\frac{3}{4}$	1	4
33	1	3 $\frac{1}{4}$	1	3 $\frac{1}{4}$	88	1	5 $\frac{1}{2}$	1	5 $\frac{1}{2}$
						25	14 $\frac{1}{2}$	30	6 $\frac{1}{2}$

LINCOLN RHD SHORTHORNS.

92	1	12 $\frac{1}{2}$	2	2 $\frac{1}{2}$	95	2	15 $\frac{1}{2}$	2	11
93	1	15 $\frac{1}{2}$	1	14 $\frac{1}{2}$	96	1	13	3	4 $\frac{1}{2}$
						8	8 $\frac{1}{4}$	10	1

BRITISH FRIESIANS.

108	1	2	2	1	134	1	2	1	9 $\frac{1}{2}$
109	1	13 $\frac{1}{4}$	2	3 $\frac{1}{2}$	135	3	2	3	1 $\frac{1}{2}$
111	0	15	1	8 $\frac{1}{2}$	136	2	8	2	5
114	3	5 $\frac{1}{2}$	2	13 $\frac{1}{2}$	138	1	12	1	14
119	0	14 $\frac{1}{2}$	1	4	140	2	10 $\frac{1}{2}$	2	14
120	3	10 $\frac{1}{2}$	3	5 $\frac{1}{2}$	142	1	3	2	1
122	1	12 $\frac{1}{2}$	2	2 $\frac{1}{2}$	144	1	9 $\frac{1}{2}$	1	8 $\frac{1}{2}$
123	2	1	2	7	155	0	15 $\frac{1}{2}$	1	2
124	1	11 $\frac{1}{2}$	1	11	160	1	4	1	5 $\frac{1}{2}$
132	2	3 $\frac{1}{4}$	2	8	—	—	—	—	—
						35	11 $\frac{1}{2}$	39	14 $\frac{1}{2}$

SOUTH DEVONS.

161	2	14	3	0 $\frac{1}{2}$	163	1	9	1	10 $\frac{1}{2}$
						4	7	4	10 $\frac{1}{2}$

DAIRY SOUTH DEVONS.

164	3	12 $\frac{1}{4}$	3	9 $\frac{1}{2}$	169	2	6 $\frac{1}{2}$	2	6 $\frac{1}{2}$
166	2	0	2	0 $\frac{1}{4}$	170	3	0	2	15 $\frac{1}{4}$
167	1	7 $\frac{1}{4}$	1	8 $\frac{1}{4}$	—	—	—	—	—
						12	10 $\frac{1}{2}$	12	9 $\frac{1}{4}$

TABLE IV.—COMPARISON OF CHURNINGS WITH ANALYSES—*Continued.*

DEVONS.

No. in Catalogue.	Weight of Butter Churned.		Total Fat by Analyses.		No. in Catalogue.	Weight of Butter Churned.		Total Fat by Analyses.	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
171	1	3	1	3½	173	1	1	1	0½
						2	4	2	3¾

RED POLLS.

174	1	4	2	1½	193	3	0½	2	10½
177		6½	1	8	195	1	12½	1	12½
179	1	5½	1	9½	196	1	8	1	9½
181	2	3¾	2	9½	197	2	9¾	2	10½
182	1	13	1	14½	198	1	14½	2	5½
187	1	11	2	5½	200	1	6	1	14½
188	2	3½	3	1½	211	2	3½	2	2
191	2	0	2	9	214	0	11	0	14½
192	2	2½	2	9½	—				
						31	3	36	5½

AYRSHIRES.

225	3	3¾	2	14½	245	2	3¾	2	8¾
230	2	10½	2	11½	246	2	15¾	2	13¾
231	2	4½	2	0½	247	1	3¾	1	2½
232	2	9½	2	10½	248	1	9½	2	3¾
233	2	11½	2	14½	249	0	14½	1	8
235	2	0½	1	15½	252	1	9	1	10¾
236	13		2	11	253	1	7½	1	11
237	2	0½	2	2	254	1	14	1	12¾
238	2	4½	2	3¾	257	2	3½	2	2
239	2	14½	2	13	258	2	5½	2	3½
240	2	10	2	6	259	2	1	2	4½
243	2	6½	2	12½	261	1	8	1	9
244	3	8	3	5					
						55	15½	57	1½

GUERNSEYS.

262	1	10	1	11½	270	2	6½	2	2½
263	2	3	2	3½	271	2	2	1	14½
265	2	10½	2	5½	272	1	10½	1	11½
266	2	3¾	2	3½	274	0	14½	1	4½
268	1	11	1	6½	275	1	3½	1	2½
						18	10½	18	0½

TABLE IV.—COMPARISON OF CHURNINGS WITH ANALYSES—*Continued.*

JERSEYS.

No. in Catalogue.	Weight of Butter Churned.		Total Fat by Analyses.		No. in Catalogue.	Weight of Butter Churned.		Total Fat by Analyses.	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
277	2	8	2	5 $\frac{3}{4}$	295	1	10 $\frac{1}{2}$	1	11 $\frac{1}{2}$
278	3	6	2	12 $\frac{1}{4}$	296	2	8	2	3 $\frac{3}{4}$
279	1	3 $\frac{1}{2}$	1	6 $\frac{1}{2}$	297	2	5 $\frac{1}{2}$	2	6
280	2	8 $\frac{3}{4}$	2	6 $\frac{3}{4}$	298	2	1 $\frac{1}{2}$	2	1
284	2	2	2	1 $\frac{1}{2}$	300	2	13 $\frac{3}{4}$	2	8 $\frac{1}{2}$
285	2	0 $\frac{1}{4}$	1	12	301	1	12 $\frac{3}{4}$	1	15
286	2	2	1	13 $\frac{1}{4}$	305	2	0 $\frac{3}{4}$	1	14 $\frac{1}{2}$
291	2	8	2	5 $\frac{1}{2}$	311	1	9	1	7 $\frac{1}{4}$
292	2	11 $\frac{1}{2}$	2	1	317	2	1 $\frac{1}{2}$	2	15 $\frac{1}{4}$
293	2	9 $\frac{3}{4}$	2	6 $\frac{3}{4}$	318	1	13	1	11
294	2	2	2	1 $\frac{1}{2}$	322	1	14 $\frac{3}{4}$	1	10
						47	14 $\frac{1}{4}$	45	0

KERRIES.

326	0	15 $\frac{1}{2}$	1	6 $\frac{1}{2}$	334	1	5	1	5 $\frac{3}{4}$
						2	4 $\frac{1}{2}$	2	12 $\frac{1}{4}$

DEXTERS.

338	1	15 $\frac{3}{4}$	1	15	341	1	4	0	15 $\frac{3}{4}$
339	1	0 $\frac{1}{2}$	1	4 $\frac{1}{2}$	343	1	4	1	3
340	1	4	1	8					
						6	12 $\frac{1}{4}$	6	14 $\frac{1}{4}$

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND
CHEMICAL ANALYSES FROM 1919.

Year.	Breed.					Churn.	Analyses.
						Lbs. Butter.	Lbs. Fat.
1919	Shorthorns	...	...	...	...	43.86	42.40
1920	"	...	...	...	...	51.25	52.57
1921	"	...	...	...	...	94.84	112.69
1922	"	...	...	...	...	61.26	71.69
1923	"	...	...	...	...	65.15	71.94
1924	"	...	...	...	...	35.02	36.15
1925	"	...	...	...	...	25.75	28.81
1926	"	...	...	...	...	42.81	45.04
1928	"	...	...	...	...	25.91	30.40
1919	Lincolnshire Red Shorthorns	...	...	...	...	7.47	7.15
1920	"	"	"	...	...	5.37	5.81
1921	"	"	"	...	...	12.77	13.01
1922	"	"	"	...	...	15.62	14.96
1923	"	"	"	...	...	16.90	19.72
1924	"	"	"	...	...	14.06	12.98
1925	"	"	"	...	...	20.89	21.62
1926	"	"	"	...	...	10.11	9.44
1928	"	"	"	...	...	8.52	10.06
1919	British Friesians	...	...	...	...	3.31	3.33
1920	"	...	...	...	...	27.10	29.06
1921	"	...	...	...	...	21.81	25.18
1922	"	...	...	...	...	38.37	44.50
1923	"	...	...	...	...	22.92	27.32
1924	"	...	...	...	...	40.37	46.74
1925	"	...	...	...	...	39.05	43.73
1926	"	...	...	...	...	50.65	53.97
1928	"	...	...	...	...	35.71	39.92
1921	South Devons	...	...	...	...	9.46	10.50
1922	"	...	...	...	...	9.25	9.71
1923	"	...	...	...	...	6.02	7.13
1925	"	...	...	...	...	39.04	4.05
1926	"	...	...	...	...	3.16	3.20
1928	"	...	...	...	...	4.44	4.65
1925	Dairy South Devons	...	...	...	...	2.28	2.31
1928	"	"	"	...	...	12.65	12.58
1919	Devons	...	...	...	...	7.92	8.10
1920	"	...	...	...	...	3.94	3.59
1921	"	...	...	...	...	11.58	12.73
1922	"	...	...	...	...	11.69	12.72
1923	"	...	...	...	...	9.51	9.88
1924	"	...	...	...	...	4.97	5.76
1925	"	...	...	...	...	14.64	16.02
1926	"	...	...	...	...	2.23	2.28
1928	"	...	...	...	...	2.25	2.24
1919	Red Polls	...	...	...	...	16.71	18.33
1920	"	...	...	...	...	15.98	18.89
1921	"	...	...	...	...	27.06	29.98
1922	"	...	...	...	...	28.33	35.61
1923	"	...	...	...	...	21.07	24.15
1924	"	...	...	...	...	25.12	28.36
1925	"	...	...	...	...	10.28	13.04
1926	"	...	...	...	...	28.75	31.03
1928	"	...	...	...	...	31.19	36.33

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND
CHEMICAL ANALYSES FROM 1919—*Continued.*

Year.	Breed.	Churn.		Analyses.	
		Lbs. Butter.		Lbs. Fat.	
1924	Blue Albions	7.76		8.92	
1925	"	10.27		12.43	
1922	Welsh Blacks	7.30		6.70	
1925	"	3.92		4.47	
1926	"	1.67		1.64	
1921	Ayrshires	4.62		4.60	
1922	"	27.85		31.52	
1923	"	30.19		32.95	
1924	"	30.52		35.15	
1925	"	59.47		65.36	
1926	"	58.34		62.52	
1928	"	55.97		57.09	
1919	Guernseys	23.72		23.66	
1920	"	21.23		21.62	
1921	"	28.94		28.87	
1922	"	22.46		23.14	
1923	"	16.80		16.78	
1924	"	25.98		25.60	
1925	"	27.11		28.51	
1926	"	23.56		24.28	
1928	"	18.65		18.04	
1919	Jerseys	37.44		35.18	
1920	"	25.06		24.55	
1921	"	29.75		28.50	
1922	"	43.22		42.05	
1923	"	41.38		41.40	
1924	"	59.18		58.87	
1925	"	44.45		43.92	
1926	"	46.83		45.53	
1928	"	47.92		45.00	
1919	Kerries	4.66		4.64	
1920	"	11.50		11.48	
1921	"	18.78		21.96	
1922	"	14.14		13.57	
1923	"	10.81		9.75	
1924	"	13.11		13.75	
1925	"	13.66		14.00	
1926	"	8.21		8.47	
1928	"	2.27		2.77	
1919	Dexters	5.77		5.58	
1920	"	3.96		3.84	
1921	"	2.06		2.50	
1922	"	2.52		2.77	
1923	"	6.90		6.76	
1924	"	1.97		2.11	
1925	"	4.05		3.96	
1926	"	3.77		3.84	
1928	"	6.77		6.96	

* Does not include the fat of No. 466.

BUTTER TESTS—DAIRY SHORTHORNS.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf	No. of Days in Milk	Milk Yield				Butter Yield lbs. ozs.	Ration, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards
							Milk Yield						Colour	Quality				
							Morn. lbs ozs	Aft. lbs ozs	Even. lbs ozs	Total lbs ozs								
1	Major G. M. Mundy	Plaspower	1404	Sept. 10, 1922	Sept. 1	52	24 13	—	20 11	54 8	1 74	37.5	Pale	Fair	23.25	1.20	24.45	
3	A. R. Fish	Darlington 2nd Lady Coral	1553	Sept. 13, 1922	Sept. 11	42	26 13	—	26 8	53 5	2 54	22.8	Good	Good	37.25	0.20	37.45	2nd Prize
10	Sir Mark Collet, Bt.	St. Clare White- Bud	1391	Mar. 22, 1923	Sept. 5	48	23 14	—	25 5	49 3	1 8	32.8	Pale	Fair	24.00	0.80	24.80	
15	E. A. Smith	Longhills Briar	1280	Sept. 20, 1922	Aug. 28	56	18 8	21 13	17 10	57 14	0 15	61.5	Oily	V. Soft	15.00	1.60	16.60	
20	J. P. Morgan	Aldenham	1578	Nov. 5, 1922	Sept. 11	42	20 3	22 5	20 3	62 11	1 24	54.0	Pale	V. Soft	18.50	0.20	18.70	
26	Major S. P. Yates	Sorbrook Woodnut	1106	Mar. 3, 1925	Aug. 22	62	17 5	18 14	16 0	52 3	1 74	36.1	Pale	Soft	23.25	2.20	25.45	
29	Major G. M. Mundy	Summer Rose Clifton Duchess	1234	May 8, 1924	July 9	106	27 13	—	28 10	56 7	1 04	53.9	Pale	Fair	16.75	6.60	23.35	
30	Major G. M. Mundy	Rose 2nd Grendon Gramme	1374	Aug. 27, 1924	July 8	107	10 11	—	12 5	23 0	0 10	37.1	Pale	Fair	10.00	6.70	16.70	
32	Capt. A. S. Willis	Thornby Darling	1336	Aug. 21, 1924	Aug. 27	57	23 14	—	26 6	50 4	1 34	41.2	Pale	Soft	19.50	1.70	21.20	
33	Capt. A. S. Willis	Duchess 4th Thornby	1114	Feb. 4, 1925	Aug. 4	80	20 8	—	22 6	42 14	1 34	34.9	Pale	Fair	19.75	4.00	23.75	
42	R. Tustian	Rosamund Great Tew	1417	Sept. 14, 1924	June 28	117	19 14	—	19 5	39 3	1 9	25.2	Good	Good	25.00	7.70	32.70	4th Prize
43	R. Tustian	Sophia Great Tew	1230	Mar. 28, 1925	Oct. 4	19	22 10	—	24 11	47 5	1 34	38.5	Fair	Fair	19.75	—	19.75	
58	Sir Mark Collet, Bt.	St. Clare Daffodil 7th	1013	Mar. 24, 1926	Sept. 10	43	16 5	—	12 14	29 3	0 12	37.0	Pale	Fair	12.75	0.30	13.05	
75	J. H. Robinson	Dora	1142	Unknown	Sept. 1	52	21 10	—	23 10	45 4	2 2	21.3	Fair	Good	34.00	1.20	35.20	3rd Prize
78	T. Morley	Rose	1080	Oct. 5, 1925	Sept. 25	28	20 2	—	15 10	35 12	1 7	24.8	Fair	Fair	23.00	—	23.00	
79	T. Morley	Pearl	1128	Nov. 26, 1925	Oct. 3	20	11 10	—	12 11	24 5	1 14	22.6	Good	Good	17.25	—	17.25	
83	J. H. Robinson	Ascots Mary	1257	Unknown	Sept. 14	30	12 13	—	12 13	25 10	1 9	16.2	Fair	Fair	25.00	—	25.00	

BUTTER TESTS—SHORTHORNS—Continued.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf 1928.	No. of Days in Milk	Milk Yield				Butter Yield lbs ozs	Ratio, viz. lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards			
							Morn. lbs ozs	Aft. lbs ozs	Even. lbs ozs	Total lbs ozs			Colour	Quality							
85	Sir Mark Collet, Bt.	Merrymaid	1103	1926	June 28	117	12	10	—	12	3 24	13	0	14 1/2	27.3	Pale	Fair	14.25	7.70	21.95	Reserve 1st Prize
86	Sir Mark Collet, Bt.	St. Clare	1033	May 19, 1926	Oct. 5	18	13	8	—	14	6 27	14	0	14 1/2	30.3	Fair	Fair	14.75	—	14.75	
88	A. B. Croxon	Rachel 3rd Cassie 2nd	1183	Aug. 27, 1925	July 14	101	15	13	18	3 17	10 51	10	1	5 1/2	98.5	Pale	Good	21.50	6.10	27.60	
92	J. Evens & Son	Burton Young	1478	Aug. 18, 1922	Sept. 13	40	20	3 21	6 20	8 62	1	1	13 1/2	35.0	Good	Good	28.50	—	28.50		
93	J. Evens & Son	Cherry 6th Burton Sylvia	1291	Oct. 5, 1923	Sept. 18	35	16	3 17	6 14	8 48	1	1	15 1/2	24.7	Good	Good	31.25	—	31.25		
95	J. Evens & Son	Burton Red Rose 6th	1276	Aug. 17, 1924	Sept. 21	82	25	0 25	5 22	11 73	0	2	15 1/2	24.6	Good	Good	47.50	—	47.50	1st Prize	
96	S. Reading	Langford Damsel 21st	1270	Dec. 9, 1921	Sept. 27	26	23	13 21	14 24	3 69	14	1	13	38.5	Fair	Fair	29.00	—	29.00		

BUTTER TESTS—SHORTHORNS—Continued.

No. in Catalogue	Name of Animal	CHURNING—TIME AND TEMPERATURE				Temperature	
		Time		Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churning finished
		Churning began	Churning finished				
				Minutes	Degrees	Degrees	Degrees
1	Plaspower Darlington 2nd	9 22 a.m.	9 45 a.m.	23	60	52	54
3	Lady Coral	9 25 "	9 40 "	15	60	52	56
10	St. Clare Whitebad	9 25 "	9 38 "	13	60	52	56
15	Longhills Briar	9 29 "	9 45 "	16	60	52	57
20	Aldenhams Woodnut	9 35 "	9 56 "	21	60	52	57
26	Sorbrook Summer Rose	9 30 "	9 54 "	24	60	52	60
29	Clifton Duchess Rose 2nd	9 35 "	9 53 "	18	60	52	56
30	Grendon Granite	9 36 "	10 7 "	31	60	52	57
32	Thornby Darling Duchess 4th	10 2 "	11 6 "	64	60	52	56
33	Thornby Rosamund	9 43 "	10 12 "	29	60	52	56
42	Great Tew Sophia	9 40 "	10 0 "	20	60	52	57
43	Great Tew Sophie	9 37 "	9 50 "	13	60	52	54
58	St. Clare Daffodil 7th	9 42 "	10 16 "	34	60	52	53
75	Dora	10 0 "	10 4 "	4	60	52	56
78	Rose	9 48 "	10 9 "	21	60	52	54
79	Pearl	9 46 "	10 15 "	29	60	52	58
83	Ascots Mary	9 53 "	10 5 "	12	60	52	54
85	Merrymaid	9 39 "	10 6 "	27	60	52	57
86	St. Clare Rachel 3rd	9 41 "	10 2 "	21	60	52	56
88	Cassie 2nd	10 31 "	11 14 "	43	60	52	56
92	Burton Young Cherry 9th	10 0 "	10 25 "	25	60	52	56
93	Burton Sylvia 2nd	10 18 "	10 40 "	22	60	52	57
95	Burton Red Rose 6th	10 15 "	10 50 "	35	60	52	55
96	Langford Damsel 21st	10 31 "	11 0 "	29	60	52	56

BUTTER TESTS—BRITISH FRIESIANS.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf 1928.	No. of Days in Milk	Milk Yield				Butter Yield lbs. ozs.	Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards
							Morn.	Aft.	Even.	Total			Colour	Quality				
							lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.								
108	Capt. R. G. Buxton	Petygards Blackberry	1521	Aug. 30, 1919	Sept. 22	31	23	5 26	14 25	0 75	3 1 2	66.5	Good	Good	18.00	—	18.00	
109	C. W. H. Glossop	Lund (Imp. 1922) Blanche 22nd	1434	April 20, 1921	July 7	108	19	3 18	6 18	13 56	6 1 13 1	80.4	Fair	Good	29.75	6.50	36.25	H.C.
111	C. W. H. Glossop	Lund Juliet ...	1758	June 30, 1922	Sept. 16	37	18	13 18	11 19	0 56	8 0 15	60.1	Pale	Soft	15.00	—	15.00	
114	Miss E. M. Smith	Sudbourne	1592	Sept. 10, 1920	Sept. 23	30	29	10 29	2 28	8 87	4 3 5 1	26.0	Fair	Good	53.75	—	53.75	2nd Prize
119	Mrs. F. Downing	Glossiewilk Brooklands	1391	Oct. 25, 1920	June 29	116	11	2 16	0 13	0 40	2 0 14 1	45.1	Pale	Soft	14.25	7.60	21.85	
120	Lord Rayleigh	Terling Unique Barbara	1380	Jan. 14, 1920	Sept. 11	42	25	0 25	10 22	5 72	15 3 10 1	20.1	Pale	Soft	53.25	0.20	53.45	1st Prize
122	W. & B. Wallace	Terling Bella Donna 11th	1414	Aug. 6, 1922	Sept. 22	31	24	3 22	11 25	5 72	3 1 12 1	41.1	Fair	Fair	28.25	—	28.25	
123	G. Breakwell ...	Brislington Gamma	1593	June 19, 1921	Sept. 16	37	25	8 26	3 19	13 71	8 2 1	84.7	Good	Soft	33.00	—	33.00	
124	Edie Sykes ...	Mapleton Grace	1521	Sept. 16, 1922	Sept. 18	35	22	5 25	3 22	10 70	2 1 11 1	41.3	Good	Good	27.25	—	27.25	
132	A. Weightman	Parks Lucky 4th	1575	April 20, 1923	Sept. 1	52	27	3 26	3 26	11 80	1 2 3 1	35.9	Good	Good	35.75	1.20	36.95	H.C.
134	J. G. Stapleton	Northdean Bonnie Annie	1495	Mar. 21, 1921	June 17	128	15	6 15	10 14	10 45	10 1 2	40.3	Pale	Fair	18.00	8.80	26.80	
135	H. M. Martineau	Holyport Unity	1487	Jan. 5, 1924	Sept. 24	29	27	13 29	5 30	3 87	5 3 2	28.0	Good	Fair	50.00	—	50.00	3rd Prize
136	E. Furness ...	Iken Dairymaid	1928	Nov. 12, 1924	Aug. 22	62	22	3 24	3 25	5 71	11 2 8	28.7	Fair	Good	40.00	2.20	42.20	Reserve
138	E. Furness ...	Hamsels Paula 4th	1526	Feb. 27, 1925	Aug. 8	76	15	13 14	8 17	11 48	0 1 12	27.5	Fair	Fair	28.00	3.00	31.00	H.C.
140	T. Brown ...	Haslington Frisky	1271	Aug. 2, 1923	Oct. 2	21	25	6 25	6 25	3 75	15 2 10 1	28.8	Fair	Fair	42.25	—	42.25	4th Prize

BUTTER TESTS—BRITISH FRIESIANS—Continued.

No. In Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf	No. of Days in Milk	Milk Yield				Butter Yield ozs lbs	Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards				
							Milk Yield						Colour	Quality								
							Morn.	Aft.	Even.	Total												
							lbs	ozs	lbs	ozs	lbs	ozs										
142	A. Weightman	Deighton	1431	June 5, 1924	Sept. 20	33	21	6	21	8	21	11	64	9	1	3	54-1	Fair	Soft	10-00	—	19-00
144	J. G. Stapleton	Henrietta Elmscott Ceres	1344	Nov. 20, 1924	Sept. 9	44	12	11	13	14	13	3	89	12	1	9 $\frac{3}{4}$	24-8	Pale	Fair	25-75	0-40	26-15
155	W. & R. Wallace	May Hamel's Helena	1188	Dec. 24, 1925	Sept. 18	35	12	3	13	3	15	0	40	6	0	15 $\frac{1}{4}$	42-1	Pale	Fair	15-25	—	15-25
160	W. Curtis & Son	Barwyke Negress	1344	Oct. 23, 1925	Sept. 3	50	12	14	14	5	13	5	40	8	1	4	32-4	V. Pale	Fair	20-00	1-00	21-00

BUTTER TESTS—BRITISH FRIESIANS—Continued.

No. in Catalogue	Name of Animal	CHURNING—TIME AND TEMPERATURE				Temperature		
		Time		Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churning finished	Degrees
		Churning began	Churning finished					
				Minutes	Degrees	Degrees	Degrees	Degrees
108	Petygards Blackberry	10 3 a.m.	10 40 a.m.	37	60	52	58	58
109	Lund (Imp. 1922) Blanche 22nd	10 25 "	10 52 "	27	60	52	55	55
111	Lund Juliet	10 15 "	10 49 "	34	60	52	55	55
114	Sudbourne Flossievjik	10 45 "	11 15 "	30	60	52	56	56
119	Brooklands Barbara	10 15 "	10 50 "	35	60	52	58	58
120	Terling Unique	3 35 p.m.	3 51 p.m.	16	61	52	54	54
122	Terling Bella Donna 11th	11 15 a.m.	12 15 "	60	60	52	58	58
123	Brislington Gamma	11 10 "	11 41 a.m.	31	60	52	56	56
124	Mapleton Grace	10 32 "	11 5 "	33	60	52	55	55
132	Parks Lucky 4th	12 40 p.m.	1 5 p.m.	25	60	52	50	50
134	Northdean Bonnie Annie	10 20 a.m.	10 30 a.m.	10	60	52	52	52
135	Holyport Unity	10 42 "	11 10 "	28	60	52	57	57
136	Iken Dalymald 4th	10 30 "	10 58 "	28	60	52	55	55
138	Hamels Paula	10 45 "	11 24 "	39	61	52	55	55
140	Haslington Frisky	3 12 p.m.	3 28 p.m.	16	61	52	56	56
142	Deighton Henrietta	10 27 a.m.	11 52 a.m.	25	60	52	56	56
144	Blunscoth Ceres May	10 52 "	11 13 "	21	60	52	56	56
145	Hamels Helena	11 23 "	11 55 "	32	60	52	58	58
160	Barwyke Negress	11 36 "	12 18 p.m.	42	60	52	54	54

BUTTER TESTS—RED POLLS.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf	No. of Days in Milk	Milk Yield				Butter Yield lbs.	Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of	Awards				
							Morn. lbs. ozs	Aft. lbs. ozs	Even. lbs. ozs	Total lbs. ozs			Colour	Quality								
					1923.																	
174	N. A. Heywood	Brettenham	1384	Jan. 17, 1922	Aug. 28	56	31	0	—	31	13	62	13	1	4	50.2	Fair	20.00	1.60	21.60		
177	O. H. Smith	Bertha Manor Bay Tree	1108	June 24, 1923	Sept. 3	50	18	8	—	21	2	39	10	1	64	27.8	Fair	22.25	1.00	23.25		
179	A. Preston Jones	Ashmoor Vixen	1371	Aug. 23, 1922	Aug. 3	81	16	10	18	3	18	0	52	13	1	54	39.5	Fair	21.50	4.10	25.60	
181	C. F. Newton	Saham Darker	1356	Sept. 4, 1922	Sept. 13	40	19	8	20	13	21	11	62	0	2	34	27.8	Good	35.75	—	35.75	H.C.
182	Viscount & Sons	Longford Draught	1302	April 21, 1923	April 26	180	13	3	13	11	12	0	38	14	1	13	21.6	Fair	20.00	12.00	41.00	Reserve
187	Capt. A. Folkstone	Symphony Seven Springs	1386	Oct. 12, 1923	Sept. 22	31	22	6	21	13	21	11	65	14	1	11	39.0	Pale	27.00	—	27.00	
188	Sir Merrick R. Richardson	Quinine Knepp Beryl 3rd	1360	Oct. 10, 1923	Sept. 26	27	21	11	23	14	23	5	68	14	2	34	31.1	Pale	35.50	—	35.50	H.C.
191	Viscount Folkstone	Longford Pierrette	1296	Aug. 26, 1923	Aug. 13	71	23	13	23	0	19	10	66	7	2	0	33.2	Fair	32.00	3.10	35.10	H.C.
192	A. Preston Jones	Queen Upton Rose	1067	Aug. 28, 1924	Aug. 12	72	18	11	18	11	15	10	53	0	2	24	24.5	V. Pale	34.50	3.20	37.70	H.C.
193	A. Preston Jones	Queen Upton Minnow	1326	Jan. 7, 1925	Sept. 27	26	17	5	17	5	16	8	51	2	3	04	16.9	Fair	48.50	—	48.50	1st Prize
195	J. G. Gray	Upton Sally	1412	Feb. 9, 1924	July 5	110	15	10	16	14	15	14	48	6	1	124	27.4	Fair	28.25	7.00	35.25	H.C.
196	J. G. Gray	Hanley Ideal	1285	Jan. 22, 1924	Aug. 19	65	13	13	11	6	9	5	34	8	1	8	23.0	Fair	24.00	2.50	26.50	
197	Major J. A. Morrison	Basildon Russell	1079	Sept. 9, 1923	Aug. 11	73	23	5	20	0	22	5	65	10	2	94	25.2	Good	41.75	3.30	45.05	2nd Prize
198	Major J. A. Morrison	Kettieburgh Rosie 28th	1114	Feb. 12, 1924	Aug. 30	54	22	11	20	0	21	8	64	3	1	144	33.6	Fair	30.50	1.40	31.90	H.C.
200	W. R. Glazebrook	Lydiat Daisy	1186	Sept. 12, 1924	Sept. 5	48	16	8	16	3	16	13	49	8	1	6	35.9	Fair	22.00	0.80	22.80	
211	Major J. A. Morrison	Basildon Rosalind	1140	Oct. 23, 1925	June 27	118	19	8	17	10	18	10	55	12	2	34	25.1	Pale	35.50	7.80	43.30	3rd Prize
214	W. R. Glazebrook	Lydiat Jannet	1186	Mar. 9, 1926	Sept. 6	47	7	5	7	3	21	13	0	11	31	6	Fair	11.00	0.70	11.70		

BUTTER TESTS—RED POLLS—Continued.

No. in Catalogue	Name of Animal	CHURNING—TIME AND TEMPERATURE				
		Time		Temperature		
		Churning began	Churning finished	Duration of Churning	Dairy Degrees	Buttermilk, when churning finished Degrees
174	Brettenham Bertha	11 45 a.m.	12 15 p.m.	30	60	55
177	Manor Bay Tree	12 35 p.m.	1 10 "	35	60	54
179	Ashmoor Vixen	3 25 "	4 0 "	35	61	56
181	Scham Darker Draught	11 55 a.m.	12 26 "	31	60	54
182	Longford Symphony	12 0 noon	12 13 "	13	60	57
187	Seven Springs Quinine	11 30 a.m.	11 55 a.m.	25	60	56
188	Knepp Beryl and	11 35 "	11 58 "	23	60	54
189	Longford Pierrette	11 40 "	12 18 p.m.	38	60	55
191	Upton Rose Queen	12 20 p.m.	12 36 "	16	60	56
192	Upton Minnow	11 15 a.m.	12 30 "	75	60	57
193	Upton Sally	3 30 p.m.	3 45 "	15	61	54
195	Harley Ideal	12 37 "	1 0 "	23	60	54
196	Harley Russett	4 13 "	4 40 "	27	61	56
197	Kettleburgh Rosie 28th	12 8 "	12 31 "	23	60	58
200	Lydiate Daisy	12 5 "	12 50 "	45	60	56
201	Basilton Rosalind	12 30 "	1 5 "	35	60	55
214	Lydiate Jannett	11 37 a.m.	12 2 "	25	60	57

BUTTER TESTS—AYRSHIRES.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf 1928.	No. of Days in Milk	Milk Yield				Butter Yield ozs.	Ratio, viz., lbs. Butter to lbs. Milk	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards	
							Milk Yield						Quality						
							Morn.	Aft.	Even.	Total									
							lbs ozs	lbs	ozs	lbs ozs	ozs		Colour						
225	Jones & Watson	Harleyholm Jenny 3rd	1414	May 21, 1921	Sept. 28	25	25	13 80	14 30	6 87	3	3	Fair	Good	51.75	—	51.75	2nd Prize	
230	D. Wallace	Auchenbrain Buffy 40th	1274	Feb. 24, 1921	Sept. 27	26	19	8 19	8 20	11 59	6	2	Pale	Soft	42.50	—	42.50	H.C.	
231	D. Wallace	Auchenbrain Madge 18th	1142	Jan. 4, 1925	Sept. 11	42	18	14 19	10 20	14 59	6	2	Pale	Good	36.50	0.20	36.70	H.C.	
232	J. Cochrane	Dyreholme Buntie	1105	Dec. 10, 1920	Sept. 18	35	20	13 21	3 21	3 63	3	2	Good	Good	41.50	—	41.50	H.C.	
233	Comdr. E. W. Billyard-Leake	Dalgig Heather Bell	1232	April 7, 1923	Oct. 7	16	20	5 21	11 23	14 65	14	2	Pale	Fair	43.25	—	43.25	H.C.	
235	R. Grierson	Lochlands Lucetta	1294	April 16, 1922	Aug. 20	64	18	0 17	8 18	5 53	13	2	V. Pale	Good	32.50	2.40	34.90	H.C.	
236	F. A. Rottenburg	Meikle Knox Winnie 3rd	1205	April 26, 1924	Sept. 30	23	18	5 17	14 17	5 53	8	2	Good	Fair	45.00	—	45.00	H.C.	
237	F. A. Rottenburg	Meikle Knox Miss Sally 3rd	1348	Jan. 19, 1924	June 20	125	14	8 15	8 14	13 44	13	2	Good	Good	32.50	8.50	41.00	H.C.	
238	R. Paton	Mains of Alicia Letta	1169	Dec. 1922	Oct. 1	22	22	14 22	14 16	8 62	4	2	Pale	Good	36.25	—	36.25	H.C.	
239	R. Paton	Palmerston, Lady Jean 4th	1287	Mar. 13, 1920	Sept. 18	35	23	11 22	13 25	2 71	10	2	Fair	Good	46.25	—	46.25	Reserve	
240	M. G. Bryson	Parton Jean 2nd	1295	Oct. 1920	Sept. 16	37	23	13 23	11 21	8 69	0	2	Fair	Good	42.00	—	42.00	H.C.	
243	A. Y. Allan	Aitkenbar Winnie	1253	Aug. 12, 1920	Sept. 17	36	21	2 22	5 20	5 63	12	2	Pale	Fair	38.50	—	38.50	H.C.	
244	J. N. Drummond	Bargover Eva ...	1280	May 6, 1921	Sept. 30	23	26	13 26	10 26	5 79	12	3	Good	Good	56.00	—	56.00	1st Prize	
245	A. Cochrane	Beuchan Chloe 3rd	1216	Jan. 7, 1921	Sept. 6	47	23	2 23	10 20	13 67	9	2	Pale	Soft	35.75	0.7	36.45	H.C.	
246	Lt.-Col. R. E. Cecil	Eglinton Mains Blossom	1220	Oct. 2, 1919	Sept. 26	27	29	3	—	31	2 60	5	2	Fair	Fair	47.75	—	47.75	3rd Prize
247	A. McFarlane	Saltchrie Princess 1107	1107	Jan. 1, 1926	Aug. 22	62	14	0	—	14	3 28	3	1	Pale	Soft	19.75	2.20	21.95	

BUTTER TESTS—AYRSHIRES—Continued.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf 1928.	No. of Days in Milk				Milk Yield			Butter Yield Ratio, viz., lbs. Butter to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards	
						Milk Yield			Total ozs/lbs	Morn. lbs ozs/lbs	Aft. ozs/lbs	Even. ozs/lbs		Total ozs/lbs	Colour					Quality
						Morn.	Aft.	Even.												
248	O. D. Maxted ...	Garrington Rosie 3rd	1114	Oct. 6, 1925	Oct. 8	15	10	8 17	2 15	11 49	5	1	9 1/2	31.2	Fair	25.25	—	25.25		
249	O. D. Maxted ...	Garrington Violet 1st	1139	Jan. 12, 1926	Sept. 30	23	15	2 10	3 16	0 47	5	0	14 1/2	37.2	V. Pale	14.25	—	14.25		
252	D. Wallace ...	Auchenbrae Yellow Kate 38th	1001	Oct. 27, 1925	Sept. 7	46	17	5 15	8 16	8 49	5	1	9	31.6	Fair	25.00	0.00	25.00		
253	J. Cochrane ...	Byreholm Grace	1069	Feb. 11, 1926	Sept. 10	43	15	0 15	14 15	6 46	4	1	7 1/2	31.5	Pale	23.50	0.30	23.80		
254	J. Cochrane ...	Byreholm Gay Lass 2nd	1042	Feb. 18, 1926	Sept. 22	41	15	8 15	5 15	2 45	15	1	14	24.4	Good	30.00	—	30.00	H.C.	
257	R. Sillars & Son	Ichham Lucy ...	1146	Sept. 6, 1925	Aug. 28	56	19	6 18	6 18	5 50	1	2	3 1/2	25.3	Fair	35.50	1.00	37.10	H.C.	
258	A. W. Montgomerie	Linnhead Cora Lin 2nd	1094	Dec. 3, 1925	Sept. 24	29	19	2 19	0 18	14 57	0	2	5 1/2	24.5	Good	37.25	—	37.25	H.C.	
259	Jones & Watson	Low Baleray Lucy	1092	Jan. 12, 1926	Sept. 29	24	15	14 14	8 13	13 44	3	2	1	21.6	Fair	33.00	—	33.00	H.C.	
261	Jones & Watson	Valleyfield Thistle 10th	1020	Jan. 27, 1926	Sept. 11	42	18	11 17	10 17	3 53	8	1	8	35.6	Pale	24.00	0.20	24.20		

BUTTER TESTS—AYRSHIRES—Continued.

No. in Catalogue	Name of Animal	CHURNING—TIME AND TEMPERATURE				Buttermilk, when churning finished Degrees	
		Time		Duration of Churning Minutes	Temperature		
		Churning began	Churning finished		Dairy Degrees		Cream and Churn Degrees
225	Harleyholm Jenny 3rd	2 50 p.m.	3 15 p.m.	25	61	52	54
230	Auchenbain Binky 4th	2 37 "	4 0 "	23	61	52	60
231	Auchenbain Maggie 18th	2 33 "	3 10 "	37	61	52	56
232	Byreholme Bunde	2 30 "	2 53 "	26	61	52	54
233	Dunfer Heather Bell	2 36 "	3 23 "	57	61	52	56
235	Lochlands Linda	2 32 "	2 55 "	23	61	52	56
236	Neckie Knox Wm. 3rd	2 32 "	3 45 "	72	61	52	58
237	Neckie Knox Miss Sully 3rd	2 34 "	4 0 "	26	61	52	56
238	Neckie Knox Miss Sully 4th	2 32 "	3 0 "	28	61	52	54
239	Neckie Knox Miss Sully 5th	2 32 "	2 50 "	23	61	52	56
240	Neckie Knox Miss Sully 6th	2 32 "	3 10 "	38	61	52	56
241	Neckie Knox Miss Sully 7th	2 30 "	2 45 "	15	61	52	55
242	Neckie Knox Miss Sully 8th	2 30 "	3 2 "	32	61	52	54
243	Neckie Knox Miss Sully 9th	2 30 "	4 12 "	22	61	52	54
244	Neckie Knox Miss Sully 10th	2 30 "	4 7 "	39	61	52	53
245	Neckie Knox Miss Sully 11th	2 30 "	3 10 "	18	61	52	55
246	Neckie Knox Miss Sully 12th	2 31 "	3 38 "	55	61	52	55
247	Neckie Knox Miss Sully 13th	2 31 "	3 10 "	23	61	52	54
248	Neckie Knox Miss Sully 14th	2 30 "	4 25 "	20	61	52	58
249	Neckie Knox Miss Sully 15th	2 30 "	3 30 "	23	61	52	54
252	Neckie Knox Miss Sully 16th	2 30 "	4 45 "	54	61	52	54
253	Neckie Knox Miss Sully 17th	2 30 "	3 40 "	25	61	52	57
254	Neckie Knox Miss Sully 18th	2 30 "	4 0 "	41	61	52	55
257	Neckie Knox Miss Sully 19th	2 30 "	4 18 "	53	61	52	54
258	Neckie Knox Miss Sully 20th	2 30 "	4 0 "	20	61	52	54
259	Neckie Knox Miss Sully 21st	2 30 "	4 0 "				
261	Neckie Knox Miss Sully 22nd	2 30 "	4 0 "				

BUTTER TESTS—JERSEYS.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf 1928.	No. of Days in Milk	Milk Yield				Butter Yield lbs ozs	Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards
							Morn.	Aft.	Even.	Total			Colour	Quality				
							lbs ozs	lbs ozs	lbs ozs	lbs ozs								
277	Capt. F. B. Imbert-Terry	Blue Hayes	896	Dec. 16, 1917	April 24, 1928	17	0 14	0 12	0 43	6 2	8	17-3	Good	Good	40-00	12-00	52-00	Reserve
278	H. C. Pelly	Sixty Five	936	July 24, 1922	Sept. 6	47	20 10	20 10	20 20	3 61	7 3	6 18-1	Good	Good	54-00	0-70	54-70	2nd Prize
279	Sir H. Mackintosh	Flotsam Twin	810	Jan. 8, 1923	May 29, 1928	11	14 10	11 9	14 32	7 1	3 1/2	26-6	Good	Good	19-50	10-70	30-20	
280	C. Taylor	Donure Princess	823	April 21, 1918	July 13, 1928	13	6 17	8 17	5 48	3 2	8 1/2	12-8	Good	Good	40-75	6-20	46-95	H.C.
284	Capt. F. B. Imbert-Terry	Blue Hayes	1017	Aug. 19, 1922	Feb. 26, 1928	20	0	—	16 13	37 3	2 2	22-6	Pale	Fair	34-00	12-00	40-00	H.C.
285	Mrs. Evelyn	Bannock Wotton Sand Maiden	1068	May 26, 1918	June 23, 1928	19	8	—	19 6	38 14	2 0 1/2	19-2	Good	Good	32-25	8-20	40-45	H.C.
286	R. G. Berkeley	So Gay	985	Jan. 19, 1922	June 14, 1928	23	6	—	21 2	44 8	2 2	20-9	Good	Good	34-00	9-10	43-10	H.C.
291	W. H. Prescott	Frostie May	907	May 20, 1923	July 18, 1928	20	3	—	18 10	38 13	2 8	15-6	Good	Good	40-00	5-70	45-70	H.C.
292	G. Berry	Postmistress	899	Jan. 23, 1922	April 28, 1928	17	20 5	—	18 2	38 7	2 1 1/2	18-3	Good	Good	33-50	12-00	45-50	H.C.
293	C. Taylor	Ulrica's Love	962	Nov. 14, 1920	May 26, 1928	20	2	—	20 0	40 2	2 9 1/2	15-4	Pale	V. Soft	41-75	11-00	52-75	3rd Prize
294	W. H. Prescott	Gloria	852	May 2, 1924	June 8, 1928	14	10	—	15 0	29 10	2 2	13-9	V. Pale	Good	34-00	9-70	43-70	H.C.
295	G. Berry	Postgirl 2nd	946	Jan. 19, 1925	Mar. 20, 1928	19	5	—	16 3	35 8	1 10 1/2	21-5	Good	Good	26-50	12-00	38-50	H.C.
296	G. Berry	Nimrod's	770	Feb. 5, 1925	July 2, 1928	23	0	—	18 3	41 3	2 8	16-5	Good	Good	40-00	7-30	47-30	H.C.
297	G. Berry	Primrose Red Negro	706	June 27, 1924	Aug. 24, 1928	20	3	—	22 3	42 6	2 5 1/2	18-0	Good	Good	37-25	2-20	39-45	H.C.
298	C. Taylor	Majestic's Peggy	930	Mar. 21, 1925	Mar. 21, 1928	19	3	—	19 11	38 14	2 1 1/2	18-6	Good	Good	33-50	12-00	45-50	H.C.
300	Capt. F. B. Imbert-Terry	Blue Hayes Noble Star	1148	Dec. 15, 1923	May 29, 1928	19	2 14	5 14	5 47	12 2	13 1/2	16-7	Good	Good	45-75	10-70	56-45	1st Prize

BUTTER TESTS—JERSEYS.—Continued.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight Lbs.	Date of Birth	Date of last Calf	No. of Days in Milk	Milk Yield				Butter Yield Lbs. ozs.	Ratio, viz., lbs. Milk to lbs. butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Total Points	Awards
							Morn.	Aft.	Even.	Total								
					1928.		Lbs. ozs.	Lbs. ozs.	Lbs. ozs.	Lbs. ozs.								
301	Sir H. Mackintosh	Golden Beech	808	Aug. 25, 1923	June 24, 1924	16	3 15	6 13	13 45	0	1 12 1	25 2	Good	Good	28 75	8 10 36 85		H.C.
305	G. W. Hough	Spring Golden	1034	Sept. 18, 1924	Sept. 7	46	12 14 13	5 13	3 39	6	2 0 3	19 3	Good	Good	32 4	0 40 33 35		H.C.
311	Mrs. Evelyn	Wotton Air	805	May 18, 1926	June 5, 1926	14	14	—	12 10 27	8	1 9	17 6	Good	Good	25 00	10 00 35 00		H.C.
317	Earl of Strafford	Wrotham	801	Mar. 20, 1926	June 12, 1926	16	11	—	16 14 33	9	2 11	16 2	Good	Good	33 25	0 30 42 55		H.C.
318	J. J. Hoyle	Opal 2nd	714	April 23, 1926	June 3, 1926	13	8	—	14 2 27	10	1 13	15 3	Good	Good	29 00	10 20 30 20		H.C.
322	C. Taylor	Haughty of Minnie	786	July 14, 1926	June 27, 1926	14	0	—	15 11 29	11	1 14 1	15 5	V. Pale	Soft	30 75	7 80 38 55		H.C.

BUTTER TESTS—JERSEYS—Continued.

No. in Catalogue	Name of Animal	CHURNING—TIME AND TEMPERATURE					
		Time		Temperature			
		Churning began	Churning finished	Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churning finished
				Minutes	Degrees	Degrees	Degrees
277	Blues Hayes Sporan	4 25 p.m.	4 45 p.m.	20	61	52	62
278	Sixty Five ..	4 25 "	4 55 "	30	61	52	56
279	Flotsam Twin ..	4 40 "	4 58 "	18	61	52	57
280	Denure Princess ..	4 32 "	5 0 "	28	61	52	56
284	Blue Hayes Bannock	4 15 "	4 30 "	15	61	52	62
285	Wotton Sand Malden	4 30 "	4 54 "	24	61	52	57
286	So Gay ..	4 25 "	4 48 "	23	61	52	54
291	Frostie May ..	4 19 "	4 40 "	21	61	52	53
292	Postmistress ..	4 14 "	4 35 "	21	61	52	54
293	Uriew's Love ..	4 46 "	5 0 "	14	61	52	62
294	Gloria ..	2 38 "	3 0 "	22	61	52	55
295	Postgirl 2nd ..	12 17 "	12 50 "	33	60	52	55
296	Nimrod's Priuurose ..	4 53 "	5 16 "	23	61	52	57
297	Red N'egundo ..	12 5 "	13 21 "	16	60	52	53
298	Majestic's Peggy ..	11 50 a.m.	12 10 "	20	60	52	55
300	Blue Hayes Noble Star	2 40 p.m.	3 11 "	31	61	52	57
301	Golden Beech Daisy	12 25 "	12 45 "	20	60	52	57
305	Spring Golden Fleece	4 5 "	4 26 "	21	61	52	56
311	Wotton Air Malden ..	2 55 "	3 30 "	35	61	52	56
317	Wrotham Opal 2nd ..	2 35 "	3 14 "	39	61	52	57
318	Haughty of Minims ..	2 37 "	3 10 "	33	61	52	55
322	Pellcan ..	2 35 "	2 55 "	20	61	52	56

BUTTER TESTS—OTHER BREEDS.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf	No. of Days in Milk	Milk Yield				Butter Yield lbs. ozs.	Ratio, viz. lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards	
							Morn.		Even.				Total	Colour					Quality
							lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.									
SOUTH DEVONS																			
161	G. Wells ...	Milkmald 14th...	1658	Sept. 5, 1919	Sept. 22	31	24	13:25	10:20	3:70	10	2	14	Good	46-00	—	46-00	Prize of £3	
163	J. Wakeham ...	Rowden Lovely	1647	Feb. 5, 1925	Aug. 6	78	13	5:15	3:14	13:43	5	1	9	Fair	25-00	3-80	28-80		
DAIRY DEVONS																			
164	The Seale Hayne Agricultural Coll.	Foreman 3rd	1269	Unknown	April 27	179	17	10:20	0:19	0:57	0	3	12½	Good	60-75	12-00	72-75	Prize of £3	
166	L. K. Elmhrst	Cherry ...	1302	Unknown	July 4	111	15	10:17	5:14	14:47	13	2	0	Good	32-00	7-10	39-10	H.C.	
167	L. K. Elmhrst	Warren ...	1576	Unknown	June 29	116	10	6:11	6:10	3:31	15	1	7½	Good	23-25	7-60	30-85		
169	J. E. Furneaux	Blackpool ...	1416	Unknown	Sept. 1	52	17	11:18	6:16	10:52	11	2	6½	Good	38-50	1-20	39-70	H.C.	
170	Peter Cocks ...	Alice 50th	1571	June 16, 1921	June 20	125	17	13:19	8:18	5:55	10	3	0	Good	48-00	8-50	56-50	H.C.	
DEVONS																			
171	Major H. B. Nicholson	Wraxall	1482	Jan. 25, 1921	Feb. 22	244	12	14	—	12	2:25	0	1	3	Fair	19-40	12-00	31-40	Prize of £3
173	N. D. Lupton ...	Darling 3rd Chalmington Rebecca 3rd	1162	Mar. 28, 1925	April 23	183	12	14	—	12	14:25	12	1	1	Good	17-00	12-00	29-00	H.C.

BUTTER TESTS—OTHER BREEDS—Continued.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of last Calf 1928.	No. of Days in Milk				Milk Yield				Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	Total Number of Points	Awards	
						Morn. Aft. Even. Total				Butter Yield					Colour	Quality				
						lbs	ozs	lbs	ozs	lbs	ozs	lbs	ozs							lbs	ozs
GUERNSEYS.																				
262	R. P. Gould ...	Froones	1206	May 15, 1922	Mar. 20, 1927	9	2 13	13 11	11 34	10	1	10	21-3	Fair	Good	26-00	12-00	38-00	H.C.	
263	Misses Hargreaves	Isabel 2nd Hadham Golden Cloud 8th	992	Nov. 19, 1922	Sept. 15, 1927	38	14	0 18	14 15	11 48	9	2	3	22-2	Fair	Good	35-00	—	35-00	H.C.
265	Lord Remnant...	Southern	1152	Dec. 10, 1920	Sept. 10, 1927	43	18	13 18	14 20	5 58	0	2	10 1/2	21-8	Good	Good	42-50	0-30	42-80	Prize of £2
266	A. Chester	Starlette	1113	Mar. 14, 1924	June 2, 1927	143	15	10 14	8 14	8 44	10	2	3 1/2	20-0	Good	Good	35-75	10-30	46-05	Prize of £3
268	Misses Beatty	Calehill Dewdrop	1034	Oct. 18, 1924	June 27, 1927	118	11	8 5	14 17	14 35	4	1	11	20-8	Good	Good	27-00	7-80	84-80	H.C.
270	Misses Hargreaves	Marigold 3rd	976	July 21, 1924	Aug. 29, 1927	55	16	6 15	5 17	0 48	11	2	6 1/2	20-2	Good	Good	38-25	1-50	39-75	H.C.
271	Capt. H. Pilbrow	Nemesia	926	Aug. 3, 1924	July 15, 1927	100	12	6 12	0 12	11 37	1	2	2	17-4	Good	Good	34-00	6-00	40-00	Reserve
272	Capt. J. E. Monins	Rose of the Mill	1017	Mar. 25, 1924	July 25, 1927	90	19	13	—	20 239	15	1	10 1/2	24-3	Good	Good	26-25	5-00	31-25	H.C.
274	Mrs. J. S. Pyman	Rowanberry 4th	716	Mar. 14, 1926	Oct. 1, 1927	22	11	21 0	13 10	5 32	4	0	14 1/2	35-4	Fair	Soft	14-50	—	14-50	H.C.
275	R. P. Gould ...	Nelly's Pride of Blanche	902	Aug. 30, 1925	Mar. 3, 1927	7	8	8 10	9	13 25	15	1	3 1/2	21-6	Good	Good	19-25	12-00	31-25	H.C.
L. Derisley & Son Primrose																				
KERRIES.																				
326	J. W. Towler ...	Wadlands Sloeberry	824	Sept. 19, 1922	Oct. 1, 1927	17	0	—	14 13 31	13	0	15 1/2	32-8	Good	Fair	15-50	—	15-50	H.C.	
334	Capt. N. Zambra	Hattingley Beauty	878	Jan. 21, 1923	July 10, 1927	105	12	13 15	5 14	10 42	12	1	5	32-6	Good	Good	21-00	6-50	27-50	H.C.

BUTTER TESTS—OTHER BREEDS—Continued.

No. in Catalogue	Exhibitor	Name of Animal	Live Weight lbs.	Date of Birth	Date of Last Calf	No. of Days in Milk	Milk Yield				Butter Yield lbs. ozs.	Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total Number of Points	Awards	Prize of £s.
							Morn.	Aft.	Even.	Total			Colour	Quality					
					1928.		lbs.	ozs.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.					
338	DEXTERS. Lady Loder ...	Grinstead Taxis	756	June 16, 1921	Aug. 29	55	22	5	—	25	5 47	10	1	153	21 1	Fair	Fair	31 75	1 50 33 25
339	Mrs. H. P. May	Barbara ...	743	1915	May 25	151	10	14 11	5 11	8 33	11	1	93	32 6	Good	Fair	16 56	11 16 27 60	
340	Mrs. H. P. May	Braxted Winkle	780	Dec. 24, 1924	Aug. 13	71	12	3 12	13 11	6 36	6	1	4	29 1	Fair	Good	29 60	3 10 23 10	
341	G. N. Hunter ...	Hookstyle Just Found 2nd	607	July 28, 1926	Sept. 4	49	9	14 9	5 10	3 29	6	1	4	23 6	Good	Good	29 60	0 90 29 90	
343	Lady Loder ...	Grinstead Nightingale 3rd	578	Dec. 19, 1925	Aug. 15	69	11	11	—	12	3 23	14	1	4	19 1	Pale	Good	29 60	2 90 22 90

BUTTER TESTS—OTHER BREEDS—Continued.

No. in Catalogue	Name of Animal	CHURNING—TIME AND TEMPERATURE				
		Time		Duration of Churning	Temperature	
		Churning Began	Churning Finished		Dairy	Buttermilk, when churning finished
				Minutes	Degrees	Degrees
	KERUELS.					
320	Wadlands Shebory	12 18 p.m.	12 30 p.m.	12	60	56
334	Hattingley Beauty	3 40 "	4 10 "	30	61	58
	DEXTERS.					
338	Grinstead Texus	3 1 "	3 25 "	24	61	55
339	Barbara	4 55 "	5 15 "	20	61	54
340	Braxted Winkle... ..	12 42 "	1 9 "	27	60	54
341	Hookstyle Just Found 2nd	4 45 "	5 10 "	25	61	58
343	Grinstead Nightingale 3rd	4 50 "	5 20 "	30	61	57

NEW INVENTIONS, DAIRY SHOW, 1928.

By J. G. STAPLETON and Dr. R. S. WILLIAMS.

THERE was a very limited number of entries in the New Inventions Class at the 1928 Dairy Show; this was due to the new regulation providing that all entries in these classes must have been put to practical use prior to the Show, and that the Judges should be afforded the opportunity of inspecting the entries under working conditions prior to the Show.

Two medals were awarded—a silver one to the Dumore Automatic Bottle Washing Machine, and a bronze medal to the Perfection Milking Machine.

The Dumore Automatic Bottle Washing Machine was installed and inspected at the Midland Counties Dairy, Birmingham, and had been at work for some time when inspected. The capacity of this is 6,000 bottles per hour. It was at work on Pint Crown Cork finish bottles. In operation the dirty bottles are placed on the automatic loader which, at the right moment, moves the row of twelve bottles forward and places them in the bottle carriers. The moment one row of bottles goes forward towards the carriers, the table is available for reloading. This is effected by having a link motion connected with the pusher levers which return under the table. With this loader one operator can load 100 bottles per minute. The carriers take the bottles towards the first compartment of the soaking tank, inverting them so that all drops of milk are drained into a sloping tray, which is constantly flushed with water. Before entering the soaker, the bottles are rinsed to remove, as far as possible, all milk and loose dirt.

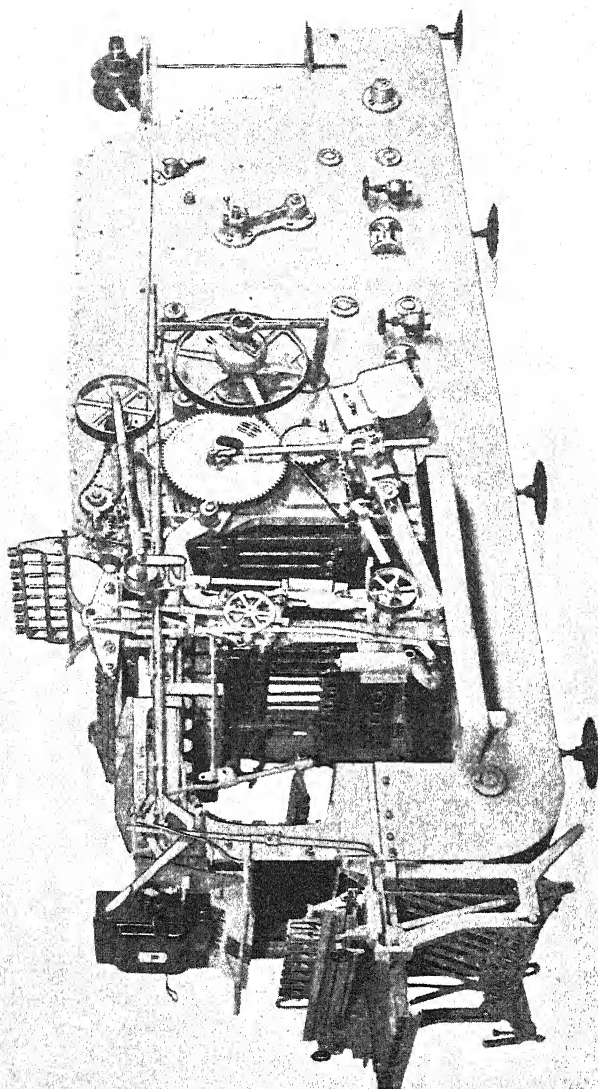
The first compartment of the soaker contains strong caustic soda solution at 110° Fahr., and the bottles enter at such an angle as to ensure complete filling with solution and are inverted as they leave the compartment to ensure all of the solution being drained from the bottles, and returned to its original compartment. The second compartment contains a weaker solution at 150° Fahr., and the

third compartment, plain water at 180° Fahr. The bottles are submerged in the soaking tank for 10 minutes, receiving both chemical and heat sterilisation. On leaving the final soaking compartment, the bottles are brushed and rinsed on the outside. This is effected by the bottles being rinsed on revolving lifter spindles, which carry them between brushes set across the washer, water at 180° Fahr. being sprayed on to the brushes and bottles. The bottles are returned to the carriers and are then subjected to two independent internal rinsings of hot water. These internal rinsings serve the double purpose of removing dirt loosened by the soaking and maintaining the temperature of the bottles. The bottles now enter the brushing section where they are first clamped by means of spring-controlled funnels and held firmly while thoroughly scrubbed internally by a row of fast revolving brushes. The brushes are flexible; the spindles are hollow and water at 180° Fahr. is injected into the bottles while they are being brushed. The bottles then pass on to a second row of brushes where the treatment is repeated. The brushing operation is followed by two further rinsings with hot water. The machine inspected was arranged so that live steam could be injected into the bottles, but this was not in use as it has been found to be superfluous. The bottles are then discharged into a sighting device where the operator can detect any imperfection at a glance, and from this device they are automatically placed on an endless gun-metal chain conveyor for transport to the filling machines, which they reach at a temperature of about 150° Fahr., at which temperature the milk is bottled at this Dairy.

The working parts of the "Dumore" are very effectively protected from damage by automatic stops which instantaneously throw out the clutch and apply a brake should there be any obstruction. This device is so arranged that the machine cannot be restarted until the obstruction is removed.

For wide mouth bottles for pasteurised milk, the soaking, sterilising, brushing and rinsing operations are identical with those described, but for these a cooling extension is provided wherein the bottles are cooled down to within a few degrees of the temperature of the water supply.

The "Dumore" inspected was driven by a 3 B.H.P. motor, and a second motor of the same size was used to circulate the hot rinsing water.



THE DUMORE AUTOMATIC BOTTLE WASHING MACHINE.

A medal was awarded to the makers of the Gascoigne Perfection Milking Machine.

This award was made as the result of a test of this machine, which had been carried out at the National Institute for Research in Dairying from February 13th, 1928, to December 9th, 1928.

Two units were used throughout the experiment, one was cleansed according to the makers' instructions; the other, after thorough washing, was sterilised by steam.

CONDITION OF THE MILK.

Samples from the bulk milk of all cows (without strippings) milked by each unit were taken, and bacteriological examinations of it were made when the milk was about 28 hours old.

The milk taken by machine and the strippings taken by hand were weighed separately and records kept.

The following table shows the results of the bacteriological examinations of the milk taken by each unit:—

TOTAL SAMPLES 154.

	Below 10,000 bacteria per 1 c.c.	Below 30,000 bacteria per 1 c.c.	Below 200,000 bacteria per 1 c.c.	Over 200,000 bacteria per 1 c.c.
Sterilised Unit	137	142	149	5
Washed Unit	49	55	71	83

The results obtained with the sterile unit were uniformly excellent. Those from the washed unit were not good and prove the necessity for thorough sterilisation of the milking parts. It is obvious that if properly cleansed and sterilised this machine will give a very clean milk.

MECHANICAL BEHAVIOUR.

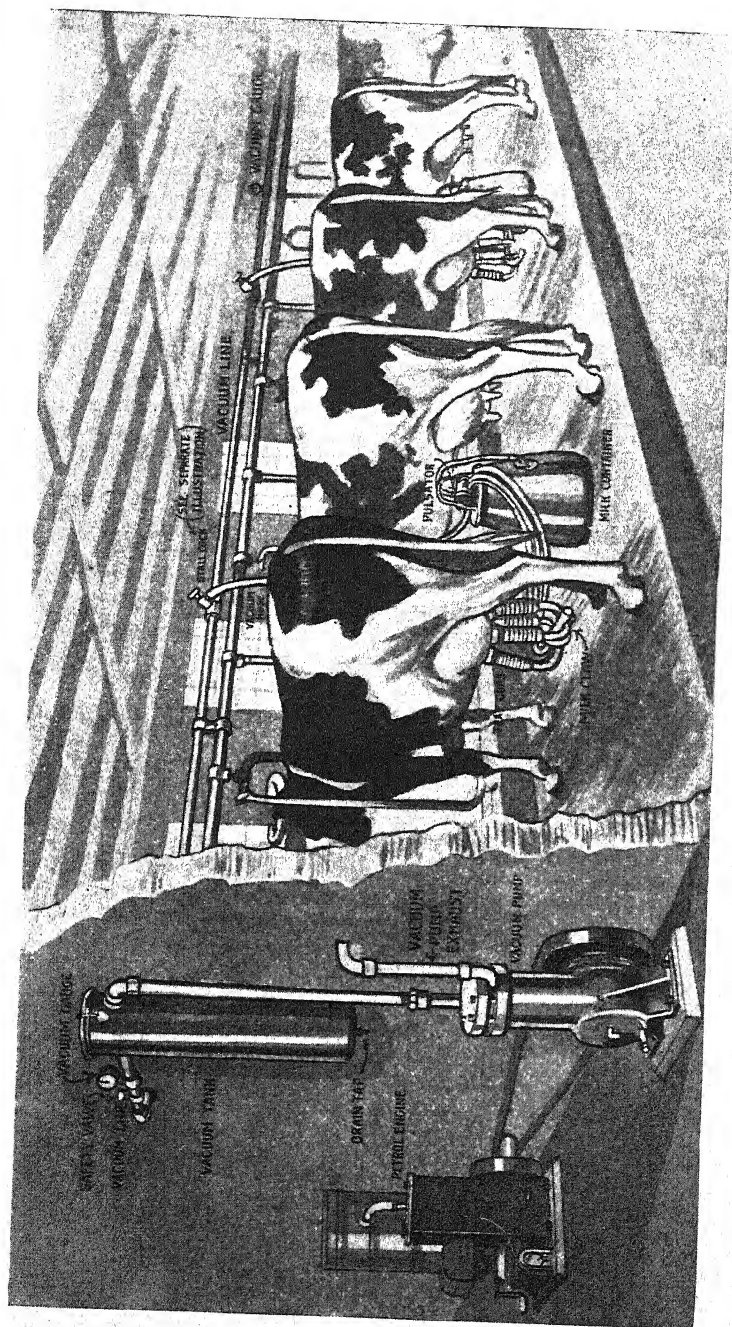
No serious trouble was experienced throughout the experiment.

MILK YIELDS.

Milk Yields were well up to the calculated standard and no rise in yield was experienced when hand milking was resorted to after more than six months of machine milking. This indicated that the machine was an efficient milker. It was noticeable that first calvers yielded less strippings than the older cows.

UDDERS AND TEATS.

No ill effects on the udders or teats were noticed.



GASCOIGNE PERFECTION MILKING MACHINE.

POULTRY SECTION—DAIRY SHOW, 1928.

By R. FLETCHER HEARNshaw, F.Z.S.

THIS section was again one of the great centres of attraction all through the Show; the total entry was a little smaller than last year, but the entries in the Bantam Section showed an increase, thus showing how popular these pigmy birds are with both the breeders and the general public for we always find an admiring crowd round them at the Show.

On account of the general trade depression the poultry entries at all Shows have fallen off this autumn, for with high railway carriage on top of the entry fees it makes Showing a much more expensive business than it used to be.

Entries being less numerous made more room for those that did turn up to be better penned, and in this direction we thought Messrs. Spratts Patent, Ltd., once again excelled themselves in the penning and feeding.

Exhibitors should always remember that late entries are never taken for this event; next year, therefore, they should send their entries as soon as they get their Schedules and so be sure of having their birds in the Show.

Mr. W. S. Brocklehurst, J.P., is still the popular Chairman of the Poultry and Pigeon Committee; he has an able Vice-Chairman in Mr. W. J. Golding, and they are well supported with a lot of willing and active men whose one aim is to make the Dairy Show the best managed Show of the year.

Mr. F. J. Bull has got properly into the work, and makes a first-class Secretary. The keen interest he takes in the Poultry Section is greatly appreciated, as is Mr. R. Kirk, who is the best Chief Steward of this Section that this Show has ever had, surrounded as he is by a very happy band of capable stewards which made everything run as smoothly as ever before at this important event.

The Gold Medal for the Best Bird in the Show was given to a lovely White Wyandotte cockerel, shown by Lord Dewar, and "The Morrison Cup"—a new trophy for the Best Bird in the Utility Section—was won by Mr. Ian B. Gow with a beautiful White Leghorn pullet.

A very interesting and instructive exhibit was that which the Ministry of Agriculture had arranged in the form of a very attractive egg-grading display in the Gilbey Hall. Here we found eggs being handled, graded, and packed, the work being carried out by assistants

in white uniforms. This, evidently, created much interest, and we do feel that farmers would be well advised to learn to put their eggs on the market in cleaner and better condition. In order to be able to compete with foreign competition our British eggs must be better marketed.

The auction of birds started, as usual, at 11 a.m. on the second day, and was conducted, as before, by Mr. Walters. Prices, on the whole, were lower, Mr. Alty's winning dark Dorking pullet made £10 10s., as did Mr. H. G. Weston's winning Aylesbury drake. Perhaps, the cheapest bird sold was the Rev. F. L. Collins' winning Black Wyandotte cockerel, £5; he was a very promising chicken. Captain Hingston's second prize Rhode Island Red pullet made £9, but this breed does not seem to be so popular at the moment.

Mr. H. Woollatt's cup-winning Bronze Turkey cockerel made £10 10s., and his second prize pullet £6 6s. Mr. Ian B. Gow's first prize Leghorn pullet sold for £6 10s., and there was a brisk demand for birds at £2, £3 and £4, in fact, during the whole Show, birds were being steadily claimed in the Selling Classes in which many real bargains are always to be found at this Show. There was a brisk demand for all the popular breeds of the moment.

Table Poultry again made a wonderful display, the competition being very keen. The London Poulterers always take a keen interest in this section and the exhibitors must be very gratified at the high prices many of these birds made; these, as usual, were sold by auction, and the birds in the unrestricted classes averaged 36s. per couple.

Mr. A. J. Falkenstein's pair of Crossbred Indian Game and Dorking pullets, which won the championship, made £11, and his winning pair of cockerels made £7 10s., rather a dear meal for the purchasers. Mr. T. Sutton's First and Medal Faverolles pullets realised £5 5s.; Mr. J. Stephen Hicks' First and Medal White Wyandotte cockerels £5, but the demand for Waterfowl for table purposes was not so good, the best prices being Mr. H. G. Weston's Silver Medal pair of Aylesbury ducklings £2 5s., and Mrs. Durman's Silver Medal Gosling 28s.

Eggs made a fine show, and the general opinion was that the judge was very consistent in his awards. Mrs. Ramshaw led the way in a strong class of Whites. That well-known exhibitor, Mr. William Farnworth, was well ahead in the class for Brown eggs, and Mr. John Lane took premier award in the tinted.

The Colonial Eggs, as usual, made an attractive display.

In the Poultry Classes, Dorkings, as a whole, were not very numerous, but good in quality. The best classes were those for Dark and Silver cockerels, respectively. In the first-named, some of the best and most typical bodies with length of breast were rather marred by a weakness of comb. It is earnestly to be hoped that this good old breed will receive better support as its importance is demonstrated by its value for crossing

for table purposes, and its supreme value was shown this year by the number of prizes awarded to Dorking and Dorking Crosses in the Table Poultry Section of this Show.

Brahmas showed quite a revival, which was a compliment to the Judge. The Dark Pullets Class, with 14 entries, was quite like old times, and there were some good birds amongst them too; in fact, the quality in both Darks and Lights was far better than last year, and it looks as if this good old breed will come to its own once more.

Cochins had 19 entries in two classes, again a big increase on last year, and the winners were well furnished. The winning Black cockerel well deserved the Medal which he took. A pretty Buff won the prize for pullets, but the second Black was also much admired.

Sussex again made a very attractive section, and, as usual, the Light Classes were the strongest, as they are still the most popular variety. The winning cockerel was a very forward bird, and he took the Special. Hackles, we thought, in both sexes have improved, and are better defined. Red entries were much the same as last year, and they were a grand lot, and no colour has shown more improvement during the last few years.

Both the Speckled and the Brown made good classes, and some very good chickens were on view in both colours.

The Buffs have probably made the biggest strides in quality and popularity. During the last two years they have improved very much in colour, especially in neck hackles, in both sexes, and are really becoming a very attractive bird.

Wyandottes are a most attractive variety and still hold their own, the special prize for the Best in the Show coming into this section.

In the Laced Varieties, of late years, there has been a tendency to let type go in order to get the perfect lacing that is so much desired, and so the laying qualities of the Laced Varieties have suffered. Entries were good in the Laced Classes, and they made a nice show. Whites were a fine lot, although not so numerous in these classes as we have seen here, but they are a wonderful farmer's fowl, and will remain popular for many years on account of their splendid utility qualities. Blacks made a nice show, and some forward chickens were to be seen amongst them.

Columbians, at the moment, do not seem to be making much headway.

Partridges seem to be becoming very popular again, and they are very pretty.

Orpingtons, as usual, had a good classification, but the entry was a mere shadow of what we used to see at this Show, although the quality was excellent. The winning Blue cockerel took the Medal, and he was a very fine specimen of his colour; the winning Buff cockerel, also much admired, taking the Cup for the best of that colour.

Rhode Island Reds, as usual, made a good show, and had a wonderful entry. With 63 single comb cockerels and 66 pullets the competition was keen. For one exhibitor to take first, second and third in a pullet class of this size was rather remarkable.

The Rose-combs are not so popular, but those exhibited had nice size and colour with good type.

Barnevelders again had a wonderful entry, and they have much improved in both type and colour, and although some people tell us that the *Welsummer* has come to take their place, we think they will be popular for a long time yet, because of the beautiful brown eggs that they lay. We thought the pullets, on the whole, were a much better lot than the cockerels, but possibly some of the best cockerels were being reserved for the Crystal Palace, for here, later on, we found a wonderful class of 33 cockerels of rare quality.

Croad Langshans—In this breed, also, quality was well maintained, although nothing really outstanding was on view. The entry of 15 cockerels and 18 pullets made a nice display, and the breed is still popular for both exhibition and utility, its beautiful brown eggs making it a favourite for the latter.

Anconas, as usual, had a good entry, but the quality was not so good as we have seen here in recent years, there being fewer birds of outstanding merit, but we did notice a great improvement in leg colour compared with the last few years.

Frizzles.—The one class for this breed had only seven entries, a nice White cockerel winning and a Red pullet second. This is a wonderful breed for egg production, and seems to thrive anywhere.

Polish were a nice lot, but only mustered eight in the class for them.

Old English Game had four classes with 96 entries. They are still very popular, and the large entry was a compliment to the Judge. The Medal in the Class for Any Other Colour, with an entry of 34, was won by a lovely grand-bodied Lemon Hackled Blue pullet.

Minorcas showed a falling off in entries, probably, the good ones are in too few hands and other newer breeds are more popular.

Andalusians made a nice show with about two dozen entries in two classes, which were about the same as last year. The breed at the moment seems to be at a standstill, and is not often exhibited except at the big Shows.

Leghorns are always a popular section here, and this year again brought forward a very nice lot of birds. The Medal for the best went to the winning Golden Duckwing cockerel, a bird of neat head, good front and balance, with nicely blended colours. The winning cockerel took the Medal for the best Exchequer.

The Browns were good classes and seem to be becoming more popular again.

The Whites came up well, and the winners were more moderate in shape and head than those we saw here a few years ago, which is all to the good.

Plymouth Rocks had six classes as before, the Barred and the Buffs were well filled, but the Any Other Colour Classes had a small entry, most of the winners in these being Whites.

Sicilian Buttercups again showed a falling off in entries, and the newer breeds seem to be taking their place, the winning pullet took the special prize.

*Silkie*s.—These little birds seem as popular as ever, and they made a great show and were much admired by everybody, for, in addition to being good layers, they make such excellent mothers, and seem to go broody at any season of the year, which is most useful from a rearing point of view. It is important to maintain size because Silkies are not Bantams. Combs are improving, plumage was good, and almost an entire absence of hard wing even in the coloured ones.

Indian Game seem to be as popular as ever, and, apart from their exhibition value, they are such a useful cross for table purposes. The 28 cockerels made a fine show, the quality on the whole was very good, and in the case of the three winners, equal to anything seen here in previous years. The pullets had an equal number of entries, and again the winners were excellent, but the pullets, as a whole, do not suggest that the quality is improving, many failing to show the double lacing so necessary in a good female, many also lacked size.

Campines again made a good show, the Silvers still being the most popular, although the Golds were a very pretty lot for the size of the bird. This bird lays a big white egg, and plenty of them.

Faverolles.—This good old French breed is still fairly popular. The cockerels were not a very forward lot, the winner being the only bird that was really fit, but the second and third showed great promise. The pullets were a nice even lot and hard to separate, the first two were large and even in colour.

Bresse showed a falling off in entries when compared with former years, but we thought the quality was good, and they made, on the whole, an attractive show.

Any Other Variety Classes at a big Show like this are always full of interest, and this year both the quality and the entry were good. In cockerels we found winning a very good specimen of that good old Scottish breed the Scots Grey Fowl, a breed that lays the big white egg, that makes a good table bird, and can live and thrive in the coldest situation. Second was a nice White Sussex, a new variety, and third a reachy Duckwing Modern Game.

In pullets, the winner, a shapely Jubilee Indian, took the Medal for the best in the two classes, the second was a Modern Duckwing Game pullet, and the third a typical Malay.

The Breeding Pens, shown in trios, always make a nice display. We think that probably the better way to divide these two classes in future would be to put all the Heavy Breeds into one class and all the Light Breeds into the other class, instead of dividing them as they are now.

This year the Class for Rock, Wyandotte, Sussex or Orpington had 14 entries. The first and second winners were both White Wyandottes. The winning trio were a very fine pen, beautifully shown, and the third were a nice trio of well-matched Barred Rocks.

The Any Other Variety had 18 entries, and the winners were a nice trio of Black Minorcas, the second a nice trio of Black-Red Old English Game very hard and fit, and the third, a rich coloured pen of Rhode Island Reds of good shape and colour.

Selling Classes at this Show always contain many real bargains, and this year was no exception to the rule, but the Selling Classes provided for Black Minorcas and Buff Orpingtons were cancelled.

Waterfowl Classes were strong and well contested, and in many of them very high quality was found. In Indian Runners we found some grand quality birds and well-filled classes, the Fawns and the Whites being the strongest.

Rouens and Aylesburys made two good classes of grand birds, and many of the best breeders were represented in them.

Magpies had one class again, with only seven entries against 12 last year. This breed has not made the headway that its originators hoped for.

Buff Orpington Ducks made a nice show, with a much smaller entry than in the previous year.

Khaki Campbell also showed a big falling off in entries, although some nice quality birds were on view.

Any Ornamental Variety, bred 1928, was cancelled, but the A. O. V. was a very strong class with 28 entries, the winner being a very pretty Muscovy, the second a really good Pekin, and the third a very good Cayuga.

Geese, on account of the very heavy railway carriage on them, were not a big entry. The Toulouse had eight entries and the Embden six.

Turkeys made a good show, and were up to past years in both size and condition. The winning Bronze cockerel was a beauty, and so was the winning White, both being well shown.

Utility showed a decrease in numbers as compared with former years, but the quality of the birds showed a distinct improvement.

Rhode Island Reds and Light Sussex were a very level lot, and many really good birds went unrewarded; type generally was good, as was colour and condition.

White Wyandottes, compared with the two above breeds, were not good, excepting about 15 of the 65 entered, although the winners were hard to find fault with, and any of the first five could have won.

Australorps made a nice class of 22, all shown in nice condition, and the winning pullet excelled in this respect.

Both the Black and the White Leghorns made good classes, with big entries.

The Any Other Variety had 53 entries and many different varieties; the winner was a Buff Plymouth Rock, the second a nice Bresse and the third a good Speckled Sussex.

Bantams showed an increase in entries on last year, which shows what a strong hold these miniatures still have on the British Poultry Breeder, as a few can often be kept where it is impossible to keep larger fowls; from a utility point of view their eggs are always useful, and for ornamental purposes they are pretty to look at.

The *Game Bantams*, both Modern and old English, were very strong classes, the exhibitors evidently appreciating the Judges appointed for these by the very large entry they made, and the quality was good all through.

In the *Variety Bantam* section only one class was cancelled, and that was the one provided for Gold Sebright cocks.

Black Rosecombs made two good classes, but Minorca Bantams could only fill one class. Pekins made two good classes. Although feathered legged birds seem to be going out of fashion Sebrights are always popular.

Japanese, Frizzles, and Polish made six good classes.

The nine Wyandotte Bantam classes filled well, especially the Partridge Wyandotte Bantams, which seem to be becoming very popular at the moment.

The pretty little Belgian Bantams, the Indians and the Hamburgs, all turned out in good numbers, and the two A. O. V. classes had good entries. A very good White Rosecomb winning the cocks and a beautiful little Scots Grey pullet the hens or pullets.

Many birds were claimed, and many real bargains were found in the *Bantam Selling classes*.

Our thanks are due to all our Judges, who appeared to give general satisfaction.

PIGEON SECTION—DAIRY SHOW, 1928.

By W. S. BROCKLEHURST, J.P.

THE Jubilee Dairy Show of the British Dairy Farmers' Association was held on October 23rd, 24th, 25th, and 26th, 1928, at the Royal Agricultural Hall, London, and all were pleased that we were able to have the cattle present this year at the Jubilee Show after their absence last year on account of Foot and Mouth Disease; and they made a grand exhibition with the Fowls, Pigeons and other sections at this year's Fiftieth Show. Although the Poultry Section was down again on last year's total, the Pigeons were only a few entries short of last year, and I give the figures for the past few years. In 1924, 3,028; in 1925, 3094; in 1926, 3,180; in 1927, 3098; and in 1928, 3084. Three thousand one hundred, or two hundred, is about as many pigeons as can be staged in the very limited space at the disposal of the Pigeon Section, with any comfort, and then not to the best advantage of the exhibits from the exhibitor's point of view, and, may I add, from the Judges' point of view as well, as some of the birds have to be staged too low, and others too high, which makes the Judges' task a very hard one indeed, and at no little discomfort to themselves at times, but by lunch time practically all the judging was finished, the cards up on the pens for the public, and anxious exhibitors who were waiting could be let into the gallery to see how they had done. As Head Steward of this Section I would like to take this opportunity of thanking all the Judges, who worked so hard to get the judging completed by one o'clock, and also the Stewards for their work in seeing that all prize cards were up on the pen by lunch time, we were thus all able to enjoy a well earned lunch after a good morning's work. This year's judging was favoured with a good light, I am pleased to say, which is a great help to some birds when being judged, and I heard no grumbling as to the awards from disappointed exhibitors, which should be very gratifying to the Judges who do their best, and take no end of pains over the job, and I beg to thank them for their morning's hard work once again.

Again the Pigeon Section was crowded all day with the public, other than exhibitors, taking a great interest in the birds and wanting to know all about them, their points and use, as I think the following little conversation between one of my stewards and a lady will show, which took place close to my office and is worth repeating. The lady seeing one of my stewards standing by the pens, asked several questions about the different birds and then asked him if he could tell her what connection the Pigeon Show had with the British Dairy Farmers. My steward was somewhat taken aback for an answer this time, but

at last said "Madam, they help to make the Dairy Show a success each year," a very good and true answer. The lady's reply was that she thought these pigeons were kept by the dairy farmers to pick up the insects off their farms.

The British Dairy Farmers' Association Trophy and Medal winners were viewed with great interest, and much admired, and the owners of these exhibits are to be congratulated on the grand specimens produced, which are good enough to carry off these much sought-after trophies and medals. I regret to say that there were one or two cases where the exhibitor has had to forfeit his prize money at this year's Show owing to his exhibit not being transferred by him in accordance with the National Pigeon Association rules, and an unrun bird had to be left out as not eligible to compete. I have heard of several other unrun birds having been shown at the Crystal Palace Show this year and which, of course, are ineligible for competition that have been reported by the N.P.A. representative at the Show, as well as several birds that have not been transferred to their new owners.

I am sorry to see that there are several Fanciers still about the country who do not know that every bird changing hands must be properly transferred to its new owner, and that every bird must be rung properly in accordance with the National Pigeon Association rules.

The winners of the principal Trophies offered each year by the British Dairy Farmers' Association are as follows for this Jubilee Show :—

The Association's Gold Medal for the Best Pigeon in the Show bred in 1928 was awarded to Class 133, Pen 1483, Mr. W. Watmough's grand young African Owl. The Reserve being Class 229, Pen 2426, Mr. J. Townsend's young Show Homer hen.

The Jones' Memorial Trophy for Best Adult Pigeon in Show was awarded to Class 31, Pen 342, Mr. H. Whitley's Norwich Cropper cock, a wonderful old pigeon. The Reserve going to Class 37, Pen 399, Mr. F. Mayer's Black Carrier cock, a pigeon of great merit and a close runner up to the winner.

The Esquilant Challenge Trophy was in competition in Section 6, and was awarded to Class 153, Pen 1677, Mr. A. C. Tattersall's young Black Modena cock, a very good pigeon and true type, and the Reserve went to Class 206, Pen 2209, Mr. H. G. King's young Bluette cock.

The Fulton Challenge Trophy for the Best Young Bird in Section 3 this year did not make much competition as only the Best Jacobin and Fantail were left to fight it out, and in the end it was awarded to Class 3, Pen 49, Mr. F. H. Jarvis's White Fantail cock, a grand pigeon, and the Jacobin being Reserve, the property of Mr. H. Coalston, Class 184, Pen 1969, a grand young Black cock.

The competition amongst the different breeds put up for the final honour of winning these much sought-after trophies is always very keen and gives the Judge much thought and a lot of work to decide which are the best birds of the different breeds nominated by their respective specialist judges, and put before him to settle who are the respective winners of cash trophies. Mr. W. E. Horsfall very kindly undertook the somewhat arduous duty and right well did he carry out that work entrusted to him, our best thanks are due to him for the trouble and care he took over it, and winners are to be congratulated on having been successful in breeding birds of such merit to carry off one of these trophies this year.

The details of the various varieties are as follows :—

Fantails numbered 160 entries in 12 classes, a small increase of six entries on last year's total 154 in the same number of classes, and 20 entries more than two years ago. They were a good lot, and the quality well up to the average. The White again being the larger proportion of birds shown, and the competition was very keen in these classes, but the Alfred Bates' Challenge Cup for best Fantail in the Show went to a grand old Blue cock of Mr. H. Wheatley, Pen 76, Class 5, while the winner of the Association's Silver Medal for Best Young Fantail went to Mr. F. H. Jarvis's grand young White cock, Pen 49, Class 3, and the same exhibit carried off the Fulton Trophy for Best in Section 3. The Whites and Saddles Classes were judged by Mr. E. R. Bird, and the remaining Classes by Mr. C. H. Pope.

Pouters numbered 32 entries in the four classes, one short of last year in the same number of classes, and a further drop of four from the 1926 Show. They were well shown, many of the birds showed very high excellence, and were in better condition than usual. These classes were judged by Mr. A. Vertill.

Pigmy Pouters.—This variety totalled 140 in 14 classes, as compared with 141 in 13 classes last year. This year, the Red and Yellow Old Birds were given a class to themselves, with the result that only a poor entry was obtained in the entire class of six. The quality was good, and the great improvement in type noticed last year has been maintained, one is pleased to see, and they were a nice lot. The Pigmy Pouter Club's Challenge Cup for the Best Pigmy Pouter cock, other than Blue, Silver or Cream, bred in the current year, was awarded to Pen 307, Class 28, Mr. F. W. Miller's White cock, the same bird winning the Association's Silver Medal for Best Young Pigmy Pouter in Show. The Challenge Cup for the Best Young Pigmy Pouter hen went to Pen 277, Class 25, Mr. W. Lindsay's grand young Black hen. The Richard Foster Challenge Cup for Best Young Red or Yellow, was awarded to Pen 289, Class 26, Mr. W. Lindsay's exhibit. Mr. A. Veitch and Mr. G. Lang were the Judges in this section.

Norwich Croppers only numbered 65 entries in six classes this year, as compared with 84 in the same number of classes last year, a drop of

19. This section has been decreasing slightly for several years now, but we hope for an increase next year. The exhibits in the section were in good condition, and quality was good all through. The Association's Bronze Medal for Best Young Norwich Cropper went to Pen 365, Class 34, and was shown by Mr. Walter Gissing. It was in this section that the Jones' Trophy winner was found in Mr. H. Whitley's grand old cock, as the Best Adult in the Show, Pen 342, Class 31. Mr. R. Doig was the Judge of these classes.

Carriers had eight classes, as last year, and numbered 86 entries as compared with 62 entries in the same number of classes the year before an increase of 24 entries, and they were a good lot, on the whole, though there are still many to be seen with too broad a skull, which is far from the true type of Carrier as laid down in the standard. Mr. F. Meyer was the winner of the Carrier Club's Challenge Cup for Best Adult Carrier, the same bird also winning the Association's Bronze Medal for Best Carrier in Show. These classes were judged by Mr. F. Machin.

Holle Croppers had 53 entries in five classes as compared with 61 entries in six classes last year, which was the biggest entry we have had in the four years that this bird has been represented at the Dairy Show. This year's Judges' remarks are as follows: The condition of the birds generally was very good, only a few had not completed their moult. The Blue Pieds were very good in type, style and carriage, but were much too gay in markings, many had Bull eyes. The Blues and Yellows were not quite as showy but were better in markings. The only Black Pied was a good one, crop, style, carriage and size just right, markings good. The Selfs were good in type, style, carriage and crop properties. A marked improvement in the colour of Yellows was found in this class.

Blue, Bars and Grizzles (also barred) were the two best classes for all-round Holle properties, and have made the most progress since their advent into this country in 1923. Colour in Grizzles has greatly improved. The Association's Bronze Medal for the Best Young Holle was won by a Blue Bar carrying a perfectly balanced crop, with head in centre, tip toeing and carrying its not too long tail at the correct angle, a good pigeon, and owned by Mr. G. Auckland, Pen 514, Class 47. In the absence of Mr. H. E. Gey of the Hague, Holland, who should have judged these classes, but through illness was unable to do so, Mr. A. J. Phillips very kindly officiated.

Barbs.—These classes were somewhat smaller than last year, having only 24 entries in three classes as compared with 30 entries in the same number of classes last year. Though a slight falling off in number the quality was well up to the standard, and a great improvement was seen in the colour of the Reds this year from what have been shown in previous years in this colour, but the greatest improvement in this bird is to be noticed in the texture and fineness of the eye-case

and the disappearance of those most objectionable heavily-fleshed watery-eyed birds so common a few years ago, and to be seen not only in the Show pen, but prize list. This breed will go ahead now that this new type of Barb is awarded all the prizes, and the others will disappear entirely from the Show pens and lofts. Mr. H. R. Jewiss again judged these classes.

Dragoons.—This variety had 350 entries in 34 classes as compared with 352 entries in 30 classes last year, and was the largest section at the Show, heading the Modena section which was easily the largest last year, by 15 more entries this. All the classes were well filled, with the exception of the Red Chequers and Yearling Grizzle hen. The quality was good throughout, and the best were well through the moult.

The George Cotton Challenge Cup for the Best cock bred in the current year went to Mr. P. J. Barnes' Blue Chequer, Pen 7006, Class 65, also taking the Association's Silver Medal for Best Young cock. The George Cotton Challenge Cup for the Best hen bred in the current year went to Mr. Norman H. Bass's Grizzle hen, Pen 808, Class 76, also the Association's Silver Medal for Best Young Dragoon hen.

The Hewitt Challenge Cup and Bronze Medal for Best White Dragoon bred in the current year was awarded to Mr. E. C. Hollebhone's young White hen, Pen 894, Class 85. The Adult and Yearling Classes were judged by Mr. T. J. Ambrose, and the Young Birds' Classes by Mr. H. S. Whitehead.

Short-faced Tumblers.—Again in this section there was a slight falling off in entries, there only being 53 entries in five classes as compared with 57 in the same number of classes last year, but, on the whole, they were a very nice lot, though many were not yet over the moult. The Almonds have not improved in ground colour, they are getting too washy in colour, but in head properties most of them were all that could be desired.

The Old Almond Hen Class was very poor in number, but contained some very typical specimens. The Association's Bronze Medal for the best Short-faced Tumbler was awarded to Major Godfrey Heseltine's Young Almond cock, Pen 945, Class 90. These classes were judged by Mr. H. W. Webb.

Long-faced Tumblers.—In the Self section of 16 classes there were 250 entries as compared with 257 entries in the same number of classes last year—a slight decrease again. The Black Self classes were a big entry and a very strong lot, and gave the Judges a big morning's work finding the winners, especially in the 1928 classes, as many Young birds were seen for the first time this year. The Reds were a grand lot and showed a great improvement in Tumbler characteristics over previous years. The Blue Bars are improving very much in the natural beak setting, and better formation of skull properties was to be seen this year. They are going well ahead now, and beat the Other Coloured Self's for the Association's Silver Medal for Best Young Self Tumbler this year.

In the Long-faced Tumblers other varieties the entry of 181 in 16 classes was a slight drop on last year's entry of 186 in the same number of classes, but the quality was well up to average, and they were well shown, particularly in the Muffed classes. The competition in the Tumbler section was, as is always, very keen. The Association's Silver Medal for the Best Long-faced Self, bred 1928, went to Mr. Arthur W. Dodd's Blue Bar cock, Pen 170, Class 104, and the Association's Silver Medal for the Best Long-faced Tumbler other than Self bred in 1928, fell to Mr. W. Bendalls' Black Mottle cock, Pen 1330, Class 117. The Judges of this section were as follows:—Mr. R. B. Farr, Junior, taking the Red Self, Yellow Self, and Blue Bar; Mr. J. W. Dickinson, taking the other Self classes, while Mr. G. E. Danks took all the other varieties of Tumblers.

English Owls.—The entries this year in the nine classes were just the same as last year, 85 only, a decrease for the last two years of 25 entries in each year. This year's Judge says as follows with regard to the quality. "I regret to say the quality in English Owls was considerably below that of the last five years, at any rate, the youngsters were the most disappointing and were the worst lot I have seen at a classic Show for years, while several of the adults and yearlings which I knew as good birds in their younger days have fallen away badly instead of growing on." Not a very encouraging report of the once famous Owl breed. We sincerely hope they are not going the same way as the African Owls have gone.

The Gatty Perpetual Challenge Cup for Best Bird bred in the current year was awarded to Mr. R. Arkwright with Pen 1462, Class 131. Mr. W. Prince Smith judged these classes.

African Owls.—This year the B. D. F. A. Poultry and Pigeon Committee again put two young classes for this one breed, but a very poor and disappointing response was forthcoming, there only being six young cocks, and seven young hens in the two classes, 13 in all, the entries all but one, coming from three lofts only, a very bad state of affairs for the African Owl Fancy, and I often wonder, like many others who have spoken to me on the matter, what that great Owl Fancier, who has left such a handsome Trophy to the African Owl Fancy and to his memory, to be competed for at the Dairy Show each year, would have said if he saw an entry of 13 birds only in competition for his Trophy this year, and last not half that number, and the classes cancelled. Something must be wrong. The Gatty Perpetual Challenge Cup for best Young African Owl went to Mr. W. Watmough's Young cock, pen 1483, Class 133, the same bird winning the Association's Gold Medal for Best Young pigeon in the Show, a grand young pigeon. These two classes were taken by Mr. H. R. Champness.

Turbits showed a decrease of 16 entries as compared with last year, there being 61 entries in eight classes as compared with 77 entries in the same number of classes last year, which is far below the numbers

seen at the Dairy Show in former years. Though a poor entry, the quality was very good and most of the birds shown were well through the moult and in good condition. The Association's Bronze Medal for the Best Young Turbit was awarded to Messrs. Forvargue Bros., Pen 1532, Class 140. These classes were judged by Mr. H. R. Champness.

Archangels brought together 52 entries in four classes, an increase on last year's total of 48 in the same number of classes, but a few short of the year before. The young classes were both good in quality and numbers, and they were well up to standard, and a great improvement is to be seen in the proper lustre and colour that this breed should possess. The Bronze Medal of the Association for Best Young birds fell to Miss I. C. Gardener's Young hen, Pen 1596, Class 146, a grand young bird of much merit. Mr. H. Leigh-Lye judged these classes.

Modenas numbered 335 entries in 34 classes as compared with 402 entries in 34 classes last year, 67 entries less, but that can be accounted for by the fact that one of the exhibitors who took part of this section last year was now judging and not able to show. This variety has improved more than any in the last few years, and a finer type of Modena is seen in the Show pens with good head and body proportions. They were a very good lot, well through their moult and shown in good condition, and one saw very few bad birds shown

The Modena Club Cups were awarded as follows :—

The Modena Club Challenge Cup for the Best Gazzi cock bred in the current year was awarded to Mr. A. C. Tattersall's grand Young Black Gazzi cock, Pen 1677, Class 153, this same bird taking the Association's Silver Medal for Best Young Gazzi Modena, and also the Esquilant Trophy.

The Modena Club Challenge Cup for the Best Schietti cock bred in the current year went to Mr. A. C. Tattersall's Young Red Laced, Red Schietti cock, Pen 1908, Class 175. This same bird also took the Association's Silver Medal for Best Young Schietti.

The Modena Club Challenge Cup for the Best Adult Gazzi Modena hen went to Mr. A. C. Tattersall's Blue Tri-coloured hen, Pen 1718, Class 156.

The Modena Club Challenge Cup for the Best Adult Schietti hen went to Mr. W. S. Brocklehurst's Blue Schietti hen, Pen 1829, Class 166.

Mr. W. F. Holmes judged the Gazzi classes and Mr. F. H. Cobb took the Schietti classes.

Jacobins numbered 55 entries in six classes, only one short of last year's entry in the same number of classes. The Judge's remarks on the six classes are as follows : "The two Adult classes were of

very good quality throughout, particularly the Adult Winning Black. The winning Young Black cock was of outstanding quality, and the whole of the A.O. colour class bred in 1928 were of excellent quality throughout. In the Young Red class and the Young Yellow class, with the exception of the winner in each, were of extremely poor quality in comparison with the usual standard of birds at this Show, though it is only fair to state that some of these were not quite ready and may improve a great deal later in the season."

The Bronze Medal of the Association for the Best Young Jacobin, bred in 1928, was awarded to Mr. H. Coalston's Young Black cock, Pen 1969, Class 184. The Judge of these classes was Mr. H. A. Cobbe.

Nuns showed a great improvement in both numbers and quality, this year there being 93 entries in six classes as compared with 77 entries in six classes last year. They were a grand lot of birds, and the young classes came up well in numbers as well as quality and were well through the moult. The Blacks were a grand lot, but the Best Young hen to win the Association's Bronze Medal for Best Young bird was a grand Dun hen, belonging to Mr. J. Weeks, Pen 2058, Class 190. This section was judged by Mr. J. A. Walker.

Oriental Frills numbered 125 entries in 14 classes as compared with 146 in the same number of classes last year, it being 21 down. Several of the classes were very badly supported, and although there are several new recruits in this breed, and they did some of the winning, this very taking variety does not seem to grow, and the classes are never well filled. The type in the Satinettes has improved a good deal, and some very beautiful birds were to be seen. The Association's Silver Medal for the Best Bird bred in 1928 was awarded to Mr. H. E. King's Young cock, Pen 2209, Class 206. These classes were taken by Mr. C. Hall.

Magpies were three down on last year's entry, there being 71 entries in six classes as compared with 74 entries in the same number of classes. This variety has much improved in type and they are getting more like the neat little pigeon one used to see a few years ago. The Association's Bronze Medal for Best Young Bird bred in 1928 was awarded to Messrs. Sing, Meredith and Bishop's Young Yellow hen, Pen 2262, Class 210.

Marthams.—One class brought together eight entries, one more than last year, and the type is much about what has been seen the last year or two—a slight improvement. This class, as well as the Magpies' classes, were taken by Mr. W. Machin.

Antwerps had six classes with only 38 entries in them, as compared with 43 entries in the same number of classes last year, a very poor entry indeed. The Young Long-faced classes were very small, there being only ten entries in two classes. Though the quality was good

and the great improvement seen last year in the absence of coarseness and wet-eyed birds was again noticeable, and they were a nice lot and of good type and well shown. The winner of the Association's Bronze Medal for the Best Young Bird was awarded to Mr. Walter James' Long-faced Young cock, Pen 2328, Class 218. The classes were judged by Mr. C. Mawson.

Show Homers numbered 123 entries in 12 classes as compared with 120 entries in the same number of classes last year. In this section the Judge found several birds of outstanding quality, namely, the winning Adult Black Chequer hen, a bird which, although four years old, is as neat as a youngster, and the substance of most cocks. The winning Young Black Chequer cock is a bird of much quality, but wanting a better beak, while the winning Young Red Chequer hen possessed a beak of rare substance, seldom found on the weaker sex. Beak substance and the setting of same requires more of the attention of Fanciers, for I found many very faulty beaks on otherwise good pigeons. The Association's Silver Medal for the Best Young Bird was awarded to Mr. J. Townsend's grand Young hen, Pen 2426, Class 229, while the Show Homer Club's Challenge Trophy for the Best Show Homer in the Show fell to Mr. T. Adams' Adult hen, Pen 2342, Class 221. This section was taken by Mr. A. P. Knight.

Racing Pigeons.—In this section this year there was a record entry of 326 birds in eight classes as compared with 221 entries in six classes last year. The two Trained or Not classes filled well, and a grand lot of Racing birds were on view, which gave the Judge, Mr. S. P. Griffith, a very heavy day's work, as it was well in to the afternoon before he had finished his hard task.

The winners of the three Cups, again so kindly given by our good friend Lt.-Col. A. H. Osman, are as follows :—

The Victory No. 2. Challenge Cup, which has to be won three times by the same exhibitor before he can claim it, and is for the Best Racing Pigeon in the Show, was won by Mr. R. J. Worton's Adult hen, which had flown at least 100 miles during the year, Pen 2574, Class 235.

The Cup for the Best Adult Racing Pigeon was also awarded to the same bird, Mr. R. J. Worton's Adult hen, Pen 2574, Class 235.

The Cup for the Best Racing Pigeon bred in the current year was awarded to Young hen, the property of Messrs. Snow and Watson, that had flown at least 70 miles during 1928.

The Association's Silver Medal for the Best Racing Pigeon went to R. J. Worton's "Victory" Cup winner, Pen 2574, Class 235. A wonderful Racing Bird of great quality, and shown in faultless condition.

Exhibition Flying Homers, with only 66 entries in six classes this year, as compared with 76 last year in eight classes. This section

showed a decrease of 10 entries, but the quality was good, taking them all through, and though some birds unfortunately possessed too much back skull and were too long, and much too long in feathers all through, undoubtedly there is an improvement on previous years, and the Association's Bronze Medal for the Best Bird was awarded to Mr. T. H. Williams' young cock, Pen 2797, Class 242, a pigeon of quite nice type and quality. Mr. F. A. Duke judged this class.

Genuine Homers numbered 43 entries in four classes as compared with 46 in the same number of classes last year. They showed still more uniformity of type this year than last, and were shown in good condition, and some taking birds were to be seen. Mr. T. H. Singleton judged these classes.

Variety Pigeon Classes numbered 84 entries in six classes as compared with 78 entries in six classes last year, an increase of six entries, but the classification was slightly altered this year. I will give the Judge's remarks on the various classes which are as follows :—

Ptarmigans.—15 entries. A well supported class but with most of the exhibits showing failings, which prove that Frillebarbs have been used in their breeding. The most common failings were wrong coloured eyes, and broken or odd eyes, which is evidence of Frillebarb crosses. Frillebarb crosses also show beak, shape, head-shape and excessive footfeather. Shell-crested Ptarmigans are better than plain legs in all-round Ptarmigan characteristics.

Ices.—18 entries. Poor class, most exhibitors apparently keeping out better birds owing to the length of the Show which spoils footings for other events. There was an absence of clean cut bars on all the exhibits in the Ice class, the white portion of the bar not being so conspicuous as seen on the best specimens. The black edging to the bars is not so distinctive as seen in the best specimens, quite a job to sort out a lot of medium rare specimens.

Polish Lynx.—11 entries. No class last year. One of the best classes that has appeared in England; sizes improving and lacing is better than seen for some time; no Spangled birds appeared on show, and I consider that all marked Polish Lynx are really Laced, either good or bad lacing. Two Blue and White Barred birds in this class were really good specimens. The winning Laced Lynx were nearly on size and clear lacing, which is uniformly distributed.

Swifts.—Eight entries. All placed birds belonged to one exhibitor whose Swifts are well ahead of most other exhibitors. Length of feather and centre accounts for this. The winner is easily the longest feathered bird in the class, although yet hardly completely moulted in tail length. Head points are improving in the Swifts, and the gullet is getting better. They were all shown in good condition.

Swallows had 14 entries in the one class, two more than last year, and were all pigeons of great quality. Silesian Swallows do not stand

a chance against Fairies and Bohemian Tigers, the latter possessing added points to breed for. The winning Bohemian Tiger is probably the best Tiger penned in the British Isles, and it was put down in most perfect and wonderful condition. Its alternating flight feathers combined with its perfectly marked wings and footfeather makes it a great specimen. The second Black Fairy was faulty in possessing a too heavy "Spot" on head, but it is far preferable to pen like this than to take out some of the heavy marking and leave a gap which will be easily seen. Footings on this bird are remarkable and also texture of flight feathers. In fact, all the Swallows shown were a wonderful lot.

Any Other Variety Class had 18 entries this year, a decrease of eight entries on last year, and was a wonderful class of remarkable and rare exhibits. The winning Blue Priest is about the finest Priest yet seen, the shell crest on the bird is a fine example of what a shell should be; nasal tuft is also very splendid, while colour bars, and condition were perfect. Then came a variety in a Laced Double Crested Shield with good lacing shell, tuft and footfeathers, and shown in good form. The third prize winner in this Class was a Moorenhap, an exhibit never shown in this country before; one of the Bruner and Latz Family, a remarkable specimen which fails a little in not possessing sufficient backing to shell-crest. The Breed is thought much of on the Continent and should be better known here. There were other very fine exhibits in this class of the following breeds: Lahores, Spots, Strasses, Helmets, Minks, Lark, Stork, Hungarian Tape, Runt and other variations of the Shield Family.

These rare breeds of pigeons are very attractive to the public, who crowd round these pens, and we hope that next year we may see a better show of them, if winners can be found. The Association's Bronze Medal was very justly awarded to Messrs. W. Illingsworth and Sons' Bohemian Tiger Swallow, Pen 2943, Class 254. The pigeon was much commented upon in the report of the Swallow section of this report. Mr. A. R. W. Woods handled this section.

Runts numbered 17 entries in the one class, a big increase for them of seven over last year's total and were a good lot, and were shown in better condition this year, though they do not seem to improve much in size; one has to remember they are purely a table pigeon. Mr. F. Machin judged this class.

Selling Classes again numbered six classes and had entries of 94 made up as follows: in the two classes not exceeding £5, 28 entries; in the class not exceeding £3, 33 entries, and in the class not exceeding £2, 33 entries, so as is generally the case there were many good birds to be found at very reasonable prices, and many changed hands during the Show. It is very surprising that the public did not take more advantage of these Selling Classes to secure good birds from some of the best lofts in the country.

Mr. F. Machin also judged the four Selling Classes.

In concluding this report on the Pigeon Section of the 1928 Dairy Show, I would again like to thank those who helped to get the work through in this section in the manner they did; they helped considerably towards the success of the Dairy Show, and my best thanks are due to my Assistant Steward, Mr. H. J. Heppel, and to all my other Stewards for all the help and assistance so ably and willingly given by them during the Show, which I hope was to the satisfaction and pleasure of all exhibitors and those who visited the Exhibition of 1928.

Our Secretary, Mr. F. J. Bull, is to be congratulated again on carrying through his second Show to an even greater success than the year before. I wish to thank him, and all his staff, for the help always willingly given me during the Show, when they are wanted by everyone at the same time. It is very gratifying to know from this year's success again that the Show of the British Dairy Farmers' Association held at the Royal Agricultural Hall, is as popular as ever, and we sincerely hope will continue to be so in the future.

AWARD OF PRIZES, DAIRY SHOW, 1928.

DAIRY COWS AND HEIFERS IN MILK.

Open to all Breeds.

THE BRITISH DAIRY FARMERS' ASSOCIATION'S SUPREME INDIVIDUAL CHAMPIONSHIP CHALLENGE TROPHY, for the Cow gaining the greatest number of points on Inspection (as for the Spencer Cup) in the Milking Trials (provided the quality of the Milk analysed during the Test does not fall below 3 per cent. fat, nor below 8·5 per cent. of non-fatty Solids at any Milking), and twice the number of points in the Butter Test, allowing lactation points once only. Awarded to J. N. Drummond for Ayrshire Cow "Bargower Eva."

THE "BLEDISLOE" CHALLENGE TROPHY (presented by LORD BLEDISLOE, P.C., K.B.E.), for the Best Exhibit of good all-round Dairy Cows. The Cows to compete for the Trophy shall be the first six on Milking Trial points (provided they have attained the Breed Standard), and that such animals have been considered by the Inspection Judge to be typical specimens of the Breed. Awarded to the Ayrshire Cattle Herd Book Society.

THE "MORRISON" CHALLENGE TROPHY (presented by MAJOR J. A. MORRISON, D.S.O.), for the Cow exhibited at three consecutive London Dairy Shows at which Cattle was exhibited, gaining the greatest total number of points (at the three Shows) upon Inspection, in the Milking Trials and Butter Tests, awarded to C. W. H. Glossop, for British Friesian Cow, "Lund (imp. 1922) Blanche 22nd."

THE "BARHAM" CHALLENGE CUP (presented by MR. G. TITUS BARHAM), for the Cow gaining the greatest number of points in the Milking Trials. Awarded to H. M. Martineau for British Friesian Cow "Holyport Unity."

THE "SPENCER" CHALLENGE CUP (presented by MR. J. F. SPENCER, Coronation Year, 1902), for the Cow gaining the greatest number of points by Inspection, Milking Trial, and Butter Test. Awarded to Seale-Hayne Agricultural College for Dairy South Devon Cow "Foreman 3rd."

THE "SHIRLEY" CHALLENGE CUP (presented by MR. J. L. SHIRLEY), for the Cow giving the greatest weight of milk in the Milking Trials, such milk to contain not less than 3 per cent. fat and 8·5 per cent. of non-fatty solids. Awarded to H. M. Martineau for British Friesian Cow "Holyport Unity."

THE NATIONAL MILK CHALLENGE CUP, for the Cow or Heifer of any breed, entered or eligible for the Herd Book of its breed, obtaining in the Milking Trials the greatest number of Points per 1,000 lbs. live weight for Milk with lactation points added. Awarded to H. C. Pelly for Jersey Cow "Sixty Five."

THE NATIONAL BUTTER CHALLENGE CUP, for the Cow or Heifer of any breed, entered or eligible for the Herd Book of its breed, obtaining in the Butter Tests the greatest number of points per 1,000 lbs. live weight for Butter with lactation points added. Awarded to Seale-Hayne Agricultural College for Dairy South Devon Cow "Foreman 3rd."

SPECIAL PRIZE of £10 (offered by MR. ROBERT L. MOND, J.P.), and SECOND PRIZE of £5 (offered by MURIEL COUNTESS DE LA WARR), for Two Animals, the Progeny of any particular Bull, awarded respectively to O. D. Maxted for "Garrington Rosie 3rd" and "Garrington Violet 1st" (Ayrshires) and J. Cochrane for "Byreholm Grace" and "Byreholm Gay Lass 2nd" (Ayrshires).

Open only to Shorthorns.

THE "DESBOROUGH" CUP (presented by LORD DESBOROUGH, K.G., G.C.V.O.) for the Cow, exhibited in Classes 1 and 2, gaining the highest points in the Milking Trials. Awarded to E. A. Smith for "Longhills Briar."

THE "CALVERT" CHALLENGE CUP (presented by MR. HORATIO CALVERT), for the best Pedigree Dairy Shorthorn Cow or Heifer upon Inspection only. Awarded to A. R. Fish for "Lowgroves Spout 4th."

THE "SHORTHORN" BUTTER CHALLENGE CUP (presented by MAJOR S. P. YATES) for the Shorthorn Cow or Heifer entered in Classes 1 to 5 complying with all the conditions of the Butter Tests, also gaining the greatest number of points under the qualified headings. Awarded to A. R. Fish for "Lady Coral."

THE "THORNTON" CHALLENGE CUP (presented by MESSRS. JOHN THORNTON & Co.), for the best Group of Three Pedigree Dairy Shorthorn Cows and/or Heifers upon Inspection only. Awarded to A. R. Fish for "Penwortham Lady Clara 2nd," "Lady Coral" and "Lowgroves Spout 4th."

Open only to British Friesians.

THE "THORNTON" CHALLENGE CUP (presented by MESSRS. JOHN THORNTON & Co.), for the best Group of Three Pedigree British Friesian Cows and/or Heifers upon Inspection only. Awarded to A. Weightman for "Parks Lucky 4th" "Deighton Henrietta" and "Herrington Flora."

Open only to South Devons.

A SILVER CHALLENGE CUP (presented by the SOUTH DEVON HERD BOOK SOCIETY), for the Pedigree South Devon Cow gaining the greatest number of points on Inspection (as ascertained under the "Spencer" Cup), in the Milking Trials and Butter Tests. Awarded to G. Wills for "Milkmaid 14th."

Open only to Dairy South Devons.

A SILVER CHALLENGE CUP (presented by the DAIRY SOUTH DEVON CATTLE SOCIETY), for the Dairy South Devon Cow gaining the greatest number of points on Inspection (as ascertained under the "Spencer" Cup), in the Milking Trials and Butter Tests. Awarded to Seale-Hayne Agricultural College for "Foreman 3rd."

Open only to Devons.

THE "BUSK" PERPETUAL CHALLENGE CUP (presented by Friends of WILLIAM GOULDBUSK of Wraxhall, Dorset), for the Devon Cow or Heifer gaining the greatest number of points on Inspection, in the Milking Trials, Butter Tests, and for the Milk Record for the 12 months ending 1st October, 1928. Not awarded.

Open only to Ayrshires.

THE "ROWALLAN" CHAMPION CUP (presented by the AYRSHIRE CATTLE HERD BOOK SOCIETY of Great Britain and Ireland) for the best Ayrshire Cow or Heifer registered or eligible for registration with a number in the Ayrshire Cattle Herd Book, gaining the greatest number of points by Inspection, in the Milking Trials and Butter Tests. Awarded to J. N. Drummond for "Bargower Eva."

Open only to Guernseys.

THE "STAGENHOE" CHALLENGE CUP (presented by MRS. W. BAILEY-HAWKINS) for the Guernsey Cow or Heifer gaining the greatest number of points by Inspection (as ascertained under the "Spencer" Cup), in the Milking Trials and Butter Tests. Awarded to Lord Remnant for "Southern Starrette."

Open only to Jerseys.

THE "BLYTHWOOD" PERPETUAL CHALLENGE BOWL (presented by THE RIGHT HON. LORD BLYTH OF BLYTHWOOD) for the best Jersey Cow or Heifer on Inspection. Awarded to Mrs. Hayes Sadler for "Spiroea."

Open only to Keries.

A SILVER CHALLENGE CUP (presented by the BRITISH KERRY CATTLE SOCIETY), for the best Kerry Cow gaining the greatest number of Points in the Milking Trials. Awarded to J. W. Towler for "Wadlands Sweet Clover."

Open only to Dexters.

THE "NUTT" CHALLENGE CUP (presented by Mrs. H. J. NUTT), for the Dexter Cow or Heifer gaining the most Points by Inspection (as ascertained under the "Spencer" Cup), Milking Trials, and Butter Tests. Awarded to Lady Loder for "Grinstead Taxus."

Class 1.—DAIRY SHORTHORN COW.—Entered in or eligible for Coates' Herd Book, or its pedigree sent for such entry previous to the Show, born on or previous to 1st August, 1923. Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First* Inspection Prize (£10) and *Third* Milking Trial Prize (£3 10s.) to A. R. Fish for "Lowgroves Spout 4th." *Second* Inspection Prize (£5) to L. Hignett for "Rosamond Queen." *Third* Inspection Prize (£3) to A. R. Fish for "Penwortham Lady Clara 2nd." *First* Milking Trial Prize (£12) to E. A. Smith for "Longhills Briar." *Second* Milking Trial Prize (£6) to T. P. Preece for "Dairyman's Girl." *Extra* Inspection Prize (£5) to Major G. M. Mundy for "Plaspower Darlington 2nd."

Class 2.—DAIRY SHORTHORN COW.—Entered in or eligible for Coates' Herd Book, or its pedigree sent for such entry previous to the Show, born after 1st August, 1923, and previous to 1st August, 1925.—*First* Inspection Prize (£5) the Shorthorn Society's Prize (£10) and *First* Milking Trial Prize (£6) to J. S. Taylor for "Whatecote Elegance." *Second* Inspection Prize (£3) to Capt. A. S. Wills for "Thornby Rosamond." *Third* Inspection Prize (£2) to Capt. A. S. Wills for "Thornby Darling Duchess 4th." *Fourth* Inspection Prize (£1) to G. P. Hawkins for "Risbridge Proctor 2nd." *Second* Milking Trial Prize (£3 10s.) to Major R. F. Fuller for "Chalfield Daffodil 8th." *Third* Milking Trial Prize (£2 10s.) to Capt. A. S. Wills for "Thornby Honey."

Class 3.—DAIRY SHORTHORN HEIFER.—Entered in or eligible for Coates' Herd Book, born on or after 1st August, 1925, and having produced only one calf.—*First* Inspection Prize (£5) and the Shorthorn Society's Prize (£5) to J. P. Morgan for "Rockley Waterloo Sunset." *Second* Inspection Prize (£3) to J. Wild, Junr., for "Barnshaw Baroness." *Third* Inspection Prize (£2), *First* Milking Trial Prize (£6) and the Shorthorn Society's Prize (£5) to E. A. Smith for "Longhills Barrington Empress 2nd." *Fourth* Inspection Prize (£1) to R. Tustian for "Greattew Janette." *Second* Milking Trial Prize (£3 10s.) to Major R. F. Fuller for "Chalfield Jilt 6th." *Third* Milking Trial Prize (£2 10s.) to E. A. Smith for "Longhills Darlington 5th."

Class 4.—DAIRY SHORTHORN COW.—Not eligible for Classes 1 or 2. Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First* Inspection Prize (£10), *First* Milking Trial Prize (£12), the Dairy Shorthorn Association's Prize (£10), and *Extra* Inspection Prize (£5) to A. Broome & Sons for "Dossie." *Second* Inspection Prize (£5) to J. H. Robinson for "Dora."

- Class 5.—**DAIRY SHORTHORN HEIFER**.—Not eligible for Class 3. Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) and *First Milking Trial Prize* (£6) to Kidner Bros., for "Stokely Cross Frolic 4th." *Second Inspection Prize* (£3) and *Second Milking Trial Prize* (£3 10s.) to T. Morley for "Rose." *Third Inspection Prize* (£2) to T. Morley for "Pearl."
- Class 6.—**LINCOLNSHIRE RED SHORTHORN COW**.—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association. Cows entered in this Class must have yielded a minimum of 7,000 lbs. at five years old or over, or 5,250 lbs. at under five years old either during a lactation period of 45 weeks or for any one completed year of a recognised Milk Recording Society. *First Inspection Prize* (£10) and *Second Milking Trial Prize* (£6) to John Evens & Son for "Burton Red Rose 6th." *Second Inspection Prize* (£5) to John Evens & Son for "Burton Sylvia 2nd." *Third Inspection Prize* (£3) and *Third Milking Trial Prize* (£3 10s.) to John Evens & Son for "Burton Young Cherry 9th." *First Milking Trial Prize* (£12) and *Extra Inspection Prize* (£5) to S. Reading for "Langford Damsel 21st."
- Class 7.—**LINCOLNSHIRE RED SHORTHORN HEIFER**.—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) to Chivers & Sons, Ltd., for "Histon Duchess 11th." *Second Inspection Prize* (£3) to S. Reading to "Langford Damsel 34th." *Third Inspection Prize* (£2) and *First Milking Trial Prize* (£8 10s.) to S. Reading for "Langford Heaven 12th." *Second Milking Trial Prize* (£5) to John Evens & Son for "Burton Hempy 12th." *Third Milking Trial Prize* (£2 10s.) to John Evens & Son for "Burton Rosemary 20th."
- Class 8.—**BRITISH FRIESIAN COW**.—Entered in or eligible for the Herd Book. Born on or previous to 1st August, 1923. Cows entered in this Class must have yielded a minimum of 8,000 lbs., at five years old or over, or 6,000 lbs. at under five years old either during a lactation period of 45 weeks or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£10) *Extra Inspection Prize* (£5) and *Second Milking Trial Prize* (£6) to Miss E. M. Smith for "Sudbourne Flossiewijk." *Second Inspection Prize* (£5) and *First Milking Trial Prize* (£12) to Lord Rayleigh for "Terling Unique." *Third Inspection Prize* (£3) and *Third Milking Trial Prize* (£3 10s.) to A. Weightman for "Parks Lucky 4th."
- Class 9.—**BRITISH FRIESIAN COW**.—Entered in or eligible for the Herd Book. Born after 1st August, 1923, and previous to 1st August, 1925. *First Inspection Prize* (£5) to A. Weightman for "Deighton Henrietta." *Second Inspection Prize* (£3) and *Third Milking Trial Prize* (£2 10s.) to E. Furness for "Iken Dairymaid 4th." *Third Inspection Prize* (£2) and *First Milking Trial Prize* (£6) to H. M. Martineau for "Holyport Unity." *Second Milking Trial Prize* (£3 10s.) to T. Brown for "Haslington Frisky."
- Class 10.—**BRITISH FRIESIAN HEIFER**.—Entered in or eligible for the Herd Book. Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) to W. Curtis & Son for "Barwyke Negress." *Second Inspection Prize* (£3) and *First Milking Trial Prize* (£6) to A. Weightman for "Herrington Flora." *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£3 10s.) to Capt. J. Christie for "Glyndebourne Skylark." *Third Milking Trial Prize* (£2 10s.) to A. Weightman for "Herrington Gladys."
- Class 11.—**SOUTH DEVON COW**.—Entered in or eligible for the Herd Book of the South Devon Herd Book Society.—Cows entered in this Class must have yielded a minimum of 7,500 lbs. at five years old or over, or 5,600 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£7) and *First Milking Trial Prize* (£8 10s.) to G. Wills for "Milkmaid 14th." *Second Inspection Prize* (£4) and *Extra Inspection Prize* (£5) to J. Wakeham for "Rowden Lovely."

Class 12.—SOUTH DEVON HEIFER.—Entered in or eligible for the Herd Book of the South Devon Herd Book Society. Born on or after 1st August, 1925, and having produced only one calf. Cancelled.

Class 13.—DAIRY SOUTH DEVON COW.—Entered in or eligible for the Herd Book of the Recorded Dairy South Devon Cattle Society.—Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old either during a lactation period of 45 weeks or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£7) *Second Milking Trial Prize* (£5) and *Extra Inspection Prize* (£5) to Peter Cocks for "Alice 50th." *Second Inspection Prize* (£4) and *First Milking Trial Prize* (£8 10s.) to the Seale-Hayne Agricultural College for "Foreman 3rd." *Third Inspection Prize* (£2) to L. K. Elmhirst for "Cherry." *Third Milking Trial Prize* (£2 10s.) to J. E. Furneaux for "Blackpool."

Class 14.—DEVON COW.—Entered in or eligible for the Herd Book or entered in the Supplemental Register of such Herd Book.—Cows entered in this Class must have yielded a minimum of 6,500 lbs. at five years old or over, or 4,800 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£7) and *Extra Inspection Prize* (£5) to Major H. B. Nicholson for "Wraxall Darling 3rd." *Second Inspection Prize* (£4) to N. D. Lupton for "Chalmington Glitter." *Third Inspection Prize* (£2) to N. D. Lupton for "Chalmington Rebecca 3rd."

Class 15.—RED POLL COW.—Entered in or eligible for the Herd Book. Born on or previous to 1st August, 1923. Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old either during a lactation period of 45 weeks or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£10) and *First Milking Trial Prize* (£12) to N. A. Heywood for "Brettenham Bertha." *Second Inspection Prize* (£5) and *Third Milking Trial Prize* (£3 10s.) to Viscount Folkestone for "Longford Symphony." *Third Inspection Prize* (£3) to A. Preston Jones for "Ashmoor Vixen." *Second Milking Trial Prize* (£6) to C. F. Newton & Sons for "Saham Darker Draught."

Class 16.—RED POLL COW.—Entered in or eligible for the Herd Book.—Born after 1st August, 1923, and previous to 1st August, 1925.—*First Inspection Prize* (£7) *Third Milking Trial Prize* (£2 10s.) and *Extra Inspection Prize* (£5) to Major J. A. Morrison, D.S.O., for "Basildon Russett." *Second Inspection Prize* (£4) to Major J. A. Morrison, D.S.O., for "Kettleburgh Rosie 28th." *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£5) to Viscount Folkestone for "Longford Pierotte." *First Milking Trial Prize* (£8 10s.) to Sir Merrik R. Burrell, Bt., C.B.E., for "Knepp Beryl 3rd."

Class 17.—RED POLL HEIFER.—Entered in or eligible for the Herd Book.—Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) and *Second Milking Trial Prize* (£3 10s.) to Major J. A. Morrison, D.S.O., for "Basildon Royal Rosie 5th." *Second Inspection Prize* (£3) and *Third Milking Trial Prize* (£2 10s.) to Mrs. M. M. Fitzgerald for "Marsden Mepris." *Third Inspection Prize* (£2) to J. B. Dimmock for "Shotford Star Duchess 191st." *First Milking Trial Prize* (£6) to Major J. A. Morrison, D.S.O., for "Basildon Rosalind 3rd."

Class 18.—BLUE ALBION COW.—Entered in or eligible for the Herd Book. Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£5), *First Milking Trial Prize* (£6), and *Extra Inspection Prize* (£5) to R. H. A. Holbech for "Seagry Alice." *Second Inspection Prize* (£3) to J. W. Towler for "Rowsley Flame."

Class 19.—BLUE ALBION HEIFER.—Entered in or eligible for the Herd Book. Born on or after 1st August, 1925, and having produced only one calf. *First Inspection Prize* (£5) and *First Milking Trial Prize* (£6) to J. W. Towler for "Wadlands Blue Bell 2nd."

Class 20.—WELSH BLACK COW.—Entered in or eligible for the Herd Book.—Cows entered in this Class must have yielded a minimum of 7,000 lbs. at five years old or over, or 5,250 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—No award.

Class 21.—AYRSHIRE COW.—Entered with a number in the Herd Book or in the Appendices.—Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,100 lbs. at under five years old either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£10), *Second Milking Trial Prize* (£6), *Extra Inspection Prize* (£5) to Jones & Watson for "Harleyholm Jenny 3rd." *Second Inspection Prize* (£5) and *First Milking Trial Prize* (£12) to J. N. Drummond for "Bargower Eva." *Third Inspection Prize* (£3) and *Third Milking Trial Prize* (£3 10s.) to R. Paton for "Palmerston Lady Jean 4th."

Class 22.—AYRSHIRE HEIFER.—Registered or eligible for registration with a number in the Herd Book or in the Appendices. Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) to Jones & Watson for "Valleyfield Tibbie 10th." *Second Inspection Prize* (£3) to Jones & Watson for "Low Balcray Lucy." *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£3 10s.) to R. Sillars & Son, for "Ickham Lucy." *First Milking Trial Prize* (£6) to A. W. Montgomerie for "Linnhead Cora Linn 2nd." *Third Milking Trial Prize* (£2 10s.) to O. D. Maxted for "Garrington Rosie 3rd."

Class 23.—GUERNSEY COW.—Entered in or eligible for the Herd Book. Born on or previous to 1st August, 1923.—Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old, either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£7) and *Third Milking Trial Prize* (£2 10s.), to R. Pearce Gould for "Froomes Isabel 2nd." *Second Inspection Prize* (£4) and *First Milking Trial Prize* (£8 10s.) to Lord Remnant for "Southern Starrette." *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£5) to the Misses Hargreaves for "Hadham Golden Cloud 8th."

Class 24.—GUERNSEY COW.—Entered in or eligible for the Herd Book. Born after 1st August, 1923, and previous to 1st August, 1925.—*First Inspection Prize* (£5) *First Milking Trial Prize* (£6) and *Extra Inspection Prize* (£5) to A. Chester Beatty for "Calehill Dewdrop." *Second Inspection Prize* (£3) to Mrs. J. S. Pyman for "Westfield Rowanberry 4th." *Third Inspection Prize* (£2) to the Misses Hargreaves for "Nazeing Marigold 3rd." *Second Milking Trial Prize* (£3 10s.) to Capt. H. J. Pilbrow for "Bosistow Nemesis." *Third Milking Trial Prize* (£2 10s.) to Capt. J. E. Monins for "Rose of the Old Mill."

Class 25.—GUERNSEY HEIFER.—Entered in or eligible for the Herd Book. Born on or after 1st August, 1925, and having produced only one calf. *First Inspection Prize* (£5) to Mrs. J. S. Pyman for "Hindhead Patricia 3rd." *Second Inspection Prize* (£3) and *First Milking Trial Prize* (£6) to Capt. J. E. Monins for "Ringwold Graceful." *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£3 10s.) to R. Pearce Gould for "Nelly's Pride of the Blanche." *Third Milking Trial Prize* (£2 10s.) to L. Derisley & Son for "Devenhouse Primrose."

- Class 26.—**JERSEY COW.**—English or Island bred. Entered in or eligible for the Herd Book.—Born on or previous to 1st August, 1923. Cows entered in this Class must have yielded a minimum of 8,000 lbs. at five years old or over, or 6,000 lbs. at under five years old, either during a lactation period of 45 weeks, or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£7) and *First Milking Trial Prize* (£8 10s.) to H. C. Pelly for "Sixty Five." *Second Inspection Prize* (£4) to Mrs. Hayes Sadler for "Spircea." *Third Inspection Prize* (£2) and *Extra Inspection Prize* (£5) to Mrs. Evelyn for "Wotton Sand Maiden." *Second Milking Trial Prize* (£5) to C. Taylor for "Demure Princess." *Third Milking Trial Prize* (£2 10s.) to C. Taylor for "Ulrica's Love."
- Class 27.—**JERSEY COW.**—English or Island bred.—Entered in or eligible for the Herd Book. Born after 1st August, 1923, and which has produced two or more calves.—*First Inspection Prize* (£5) to Sir Harold Mackintosh for "Belle des Noyers." *Second Inspection Prize* (£3) to G. Berry for "Postgirl 2nd." *Third Inspection Prize* (£2) and *First Milking Trial Prize* (£6) to Capt. F. B. Imbert-Terry for "Blue Hayes Noble Star." *Second Milking Trial Prize* (£3 10s.) to G. Berry for "Red Negundo." *Third Milking Trial Prize* (£2 10s.) to C. Taylor for "Majestic's Peggy."
- Class 28.—**JERSEY HEIFER.**—English or Island bred.—Entered in or eligible for the Herd Book. And which has produced her first and only calf at or under the age of 2½ years. *First Inspection Prize* (£5) to Mrs. Evelyn for "Fancy Edna." *Second Inspection Prize* (£3) to Mrs. Hayes Sadler for "Oxford's Lily." *Third Inspection Prize* (£2) to Brig.-Gen. J. T. Wigan for "Sweet Daisy." *First Milking Trial Prize* (£6) to Sir Harold Mackintosh for "Culverden Consus Maid." *Second Milking Trial Prize* (£3 10s.) to Earl of Strafford for "Wrotham Opal 2nd." *Third Milking Trial Prize* (£2 10s.) to J. J. Hoyle for "Haughty of Mimms."
- Class 29.—**KERRY COW.**—Entered in or eligible for the Herd Book. Cows entered in this Class must have yielded a minimum of 6,500 lbs. at five years old or over, or 4,800 lbs. at under five years old, either during a lactation period of 45 weeks or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£5), and *First Milking Trial Prize* (£6), to J. W. Towler for "Wadlands Sweet Clover." *Second Inspection Prize* (£3), *Third Milking Trial Prize* (£2 10s.) and *Extra Inspection Prize* (£5) to Capt. N. Zambra for "Hattingley Beauty." *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£3 10s.) to J. W. Towler for "Rosebud of Carton."
- Class 30.—**KERRY HEIFER.**—Entered in or eligible for the Herd Book. Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) and *First Milking Trial Prize* (£6) to Capt. N. Zambra for "Hattingley Ellen." *Second Inspection Prize* (£3) and *Second Milking Trial Prize* (£3 10s.) to Capt. N. Zambra for "Hattingley Ellenegrane." *Third Inspection Prize* (£2) to J. W. Towler for "Wadlands Flash Witch."
- Class 31.—**DEXTER COW.**—Entered in or eligible for the Herd Book. Cows entered in this Class must have yielded a minimum of 5,000 lbs. at five years old or over, or 3,750 lbs. at under five years old, either during a lactation period of 45 weeks or for any one completed year of a recognised Milk Recording Society.—*First Inspection Prize* (£5) and *First Milking Trial Prize* (£6), to Lady Loder for "Grinstead Taxus." *Second Inspection Prize* (£3) and *Second Milking Trial Prize* (£3 10s.) to Mrs. H. P. May for "Braxted Winkie." *Third Inspection Prize* (£2) *Third Milking Trial Prize* (£2 10s.) and *Extra Inspection Prize* (£5) to Mrs. H. P. May for "Barbara."
- Class 32.—**DEXTER HEIFER.**—Entered in or eligible for the Herd Book. Born on or after 1st August, 1925, and having produced only one calf.—*First Inspection Prize* (£5) and *Second Milking Trial Prize* (£3 10s.) to Lady Loder for "Grinstead Nightingale 3rd." *Second Inspection Prize* (£3) and *First Milking Trial Prize* (£6) to G. N. Hunter for "Hookstyle Just Found 2nd."

BUTTER TESTS.

SHORTHORNS, entered in Classes 1, 2, 3, 4, 5, 6 and 7.—*First Prize* (£10 and Silver Medal) to John Evens & Son for "Burton Red Rose 6th." *Second Prize* (£5 and Bronze Medal) to A. R. Fish for "Lady Coral." *Third Prize* (£3) to J. H. Robinson for "Dora." *Fourth Prize* (£2) to R. Tustian for "Greattew Sophia."

BRITISH FRIESIANS, entered in Classes 8, 9 and 10.—*First Prize* (£10 and Silver Medal) to Lord Rayleigh for "Terling Unique." *Second Prize* (£5 and Bronze Medal) to Miss E. M. Smith for "Sudbourne Flossiewijk." *Third Prize* (£3) to H. M. Martineau for "Holyport Unity." *Fourth Prize* (£2) to T. Brown for "Haslington Frisky."

RED POLLS, entered in Classes 15, 16, and 17.—*First Prize* (£5 and Silver Medal) to A. Preston Jones for "Upton Minnow." *Second Prize* (£3 and Bronze Medal) to Major J. A. Morrison, D.S.O., for "Basildon Russett." *Third Prize* (£2) to Major J. A. Morrison, D.S.O., for "Basildon Rosalind."

AYRSHIRES, entered in Classes 21 and 22.—*First Prize* (£5 and Silver Medal) to J. N. Drummond for "Bargower Eva." *Second Prize* (£3 and Bronze Medal) to Jones & Watson for "Harleyholm Jenny 3rd." *Third Prize* (£2) to Lt.-Col. R. E. Cecil, D.S.O., for "Eglinton Mains Blossom."

JERSEYS, entered in Classes 26, 27, and 28.—*First Prize* (£5) to Capt. F. B. Imbert-Terry for "Blue Hayes Noble Star." *Second Prize* (£3) to H. C. Pelly for "Sixty Five." *Third Prize* (£2) to C. Taylor for "Ulrica's Love."

OTHER BREEDS, entered in Classes 11 to 14, 18 to 20, 23 to 25 and 29 to 32 inclusive.—Prizes of £3 each to G. Wills for "Milkmaid 14th" (South Devon); Seale-Hayne Agricultural College for "Foreman 3rd" (Dairy South Devon); Major H. B. Nicholson, D.S.O., for "Wraxall Darling 3rd" (Devon); A. Chester Beatty for "Calehill Dewdrop" (Guernsey); Lady Loder for "Grinstead Taxus" (Dexter). Prize of £2 to Lord Remnant for "Southern Starrette" (Guernsey).

BULLS (Progeny of).

Class 33.—DAIRY SHORTHORN BULL (Progeny of). Entered in or eligible for Coates' Herd Book. *First Prize* (£5) to R. Tustian for "Greattew Sophia" and "Greattew Sophie" progeny of "Greattew Lord."

Class 34.—LINCOLNSHIRE RED SHORTHORN BULL (Progeny of). Entered in or eligible for the Herd Book. *First Prize* (£5) to S. Reading for "Langford Damsel 34th" and "Langford Heavens 12th" progeny of "Langford Jolly 2nd" *Second Prize* (£3) to John Evens & Son for "Burton Young Cherry 9th" and "Burton Rosemary 20th" progeny of "Burton Royal Son."

Class 35.—BRITISH FRIESIAN BULL (Progeny of). Entered in or eligible for the Herd Book. *First Prize* (£5) to A. Weightman for "Herrington Flora" and "Herrington Gladys" progeny of "Brooklands Ynte." *Second Prize* (£3) to Capt. J. Christie for "Glyndebourne Skylark" and Glyndebourne Elva 3rd" progeny of "Glyndebourne (imp. 1922) Rikus."

Class 36.—RED POLL BULL (Progeny of). Entered in or eligible for the Herd Book. No award.

Class 37.—AYRSHIRE BULL (Progeny of). Entered in or eligible for the Herd Book. *First Prize* (£5) to O. D. Maxted for "Garrington Rosie 3rd" and "Garrington Violet 1st" progeny of "Ickham Souvenir." *Second Prize* (£3) to J. Cochrane for "Byreholm Grace" and "Byreholm Gay Lass 2nd" progeny of "Barr Garrylenn."

Class 38.—GUERNSEY BULL (Progeny of). Entered in or eligible for the Herd Book. *First Prize* (£5) to the Misses Hargreaves for "Hadham Golden Cloud 8th" and "Nazeing Marigold 3rd" progeny of "Downe Star of Honeymoon."

Class 39.—JERSEY BULL (Progeny of). Entered in or eligible for the Herd Book. *First Prize* (£5) to G. Berry for "Postgirl 2nd" and "Nimrod's Primrose" progeny of "Nimrod."

Class 40.—BULL OF ANY OTHER DAIRY BREED (Progeny of). Entered in or eligible for the Herd Book. No award.

SHE GOATS.

Trophies and Cups for Goats.

Open to all Breeds.

THE BRITISH GOAT SOCIETY'S TEN-GUINEA PERPETUAL CHALLENGE CUP for the Best Goat over two years that has borne a kid. Awarded to Mrs. A. Abbey for "Didgemere Dixie" (British).

THE "BARONESS BURDETT-COUTTS" PERPETUAL CHALLENGE CUP for the Goat gaining the highest number of points in the Milking Competition and by Inspection. Awarded to Mrs. A. Abbey for "Didgemere Dixie" (British).

THE "TREMEDDA SELENE" PERPETUAL CHALLENGE CUP for the Goat gaining highest points in the Milking Competition, that has given 10 lbs. of milk in 24 hours at any Show under the B.G.S. Rules after January 1st, 1920, or has been shown to have produced at home 10 lbs. of milk on an average for ten consecutive days on an officially recognised record. Awarded to Mrs. A. Abbey for "Didgemere Dixie" (British).

THE "DEWAR" PERPETUAL CHALLENGE CUP for a Female Goat in Milk, and Goatling. Awarded to Mrs. H. Maurice for "Ridgeway Rünel" (British Saanen) and "Ridgeway Runje" (British Saanen).

THE "RIDING" CHALLENGE CUP, offered by the BRITISH GOAT SOCIETY for the best Group of Three Goats exhibited by the same Owner. Awarded to Mrs. A. Abbey for "Didgemere Drusilla" (British Alpine), "Didgemere Dixie" (British) and "Didgemere Diadem" (British Alpine).

THE "DEWAR" TWENTY GUINEA PERPETUAL CHALLENGE TROPHY for the Goat entered in either the General or the Toggenburg Section of the British Goat Society's Herd Book gaining the highest number of points in the Milking Competition. Awarded to Mrs. A. Abbey for "Didgemere Dixie" (British).

Open only to Toggenburgs.

THE "TOGGENBURG" CHALLENGE CUP, presented by Miss MARJORIE HENDERSON, for the Pure Toggenburg Goat or Goatling entered in the Toggenburg Section of the British Goat Society's Herd Book, gaining the highest number of points on Inspection. Awarded to Miss M. Harrison for "Sandhill Nerine."

Open only to Anglo-Nubians.

THE "POMEROY" PERPETUAL CHALLENGE CUP and the sum of £1 for the Anglo-Nubian Goat, entered in the Anglo-Nubian Section of the British Goat Society's Herd Book, gaining the highest number of points in the Milking Competition. Not awarded.

Bronze Medal offered by the British Goat Society for the best Goatling in Classes 50 to 54. Awarded to Mrs. A. Abbey for "Didgemere Dhora" (British.)

MILKING COMPETITION FOR GOATS OF ANY VARIETY.

Class 41.—SHE-GOAT qualified as "Star or 'Q' Star Milker."—*First Prize* (£6 and Silver Medal), to Mrs. A. Abbey, for "Didgemere Dixie" (British). *Second Prize* £3 to Mrs. Browell for "Play of Bashley" (British). *Third Prize* (£1 10s.) to Mrs. H. Maurice for "Ridgeway Rünel" (British Saanen).

Class 42.—SHE-GOATS not eligible for Class 41.—*First Prize* (£6 and Silver Medal) to Miss M. Harrison for "Sandhill Nerine" (Toggenburg). *Second Prize* (£3) to Miss M. Henderson for "Riding Cilla" (Toggenburg). *Third Prize* (£1 10s.) to Miss M. Harrison for "Leazes Saleswoman" (Toggenburg.)

INSPECTION CLASSES.

Class 43.—SHE-GOAT, TOGGENBURG, entered in the Toggenburg Section of the Herd Book, or eligible for entry therein.—*First Prize* (£2 10s.) and British Goat Society's Breed Challenge Certificate to Miss M. Harrison for "Sandhill Nerine." *Second Prize* (£1 5s.) to Miss M. Burgess for "Riding Clytie." *Third Prize* (15s.) to Miss M. Henderson for "Riding Cilla."

Class 44.—SHE-GOAT, BRITISH TOGGENBURG OR BRITISH SAANEN.—*First Prize* (£2 10s.) to Mrs. H. Maurice for "Ridgeway Rünel" (British Saanen). *Second Prize* (£1 5s.) to Lady Forteviot for "Dupplin Dusk" (British Toggenburg).

Class 45.—SHE-GOAT, BRITISH ALPINE.—*First Prize* (£2 10s.) to Mrs. A. Abbey, for "Didgemere Drusilla," *Second Prize* (£1 5s.) to Mrs. A. Abbey, for "Didgemere Dulcette." *Third Prize* (15s.) to Miss Pope for "Pleaser of Bashley."

Class 46.—SHE-GOAT, SAANEN.—Entered in or eligible for entry in the Swiss or Saanen Section of the Herd Book.—*First Prize* (£2 10s.) and British Goat Society's Breed Challenge Certificate to Mrs. A. Abbey for "Hartshill Elsa." *Second Prize* (£1 5s.) to Mrs. A. Abbey for "Broxbourne Maud."

Class 47.—SHE-GOAT, ANGLO-NUBIAN, being any Goat entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein. No entry.

Class 48.—SHE-GOAT, ANY OTHER VARIETY, not eligible for previous Classes.—*First Prize* (£2 10s.) and two British Goat Society Challenge Certificates to Mrs. A. Abbey for "Didgemere Dixie" (British). *Second Prize* (£1 5s.) to Miss Pope for "Proverb of Bashley" (British). *Third Prize* (15s.) to Mrs. Browell for "Play of Bashley" (British).

Class 49.—SHE-GOAT that is recorded under a recognised Milk Recording Society. *First Prize* (£2 10s.) to Mrs. A. Abbey for "Didgemere Dixie" (British). *Second Prize* (£1 5s.) to Miss Pope for "Proverb of Bashley" (British). *Third Prize* (15s.) to Mrs. H. Maurice for "Ridgeway Rünel" (British Saanen).

- Class 50.—GOATLING, TOGGENBURG OR BRITISH TOGGENBURG.—Over one year but not exceeding two years.—Cancelled.
- Class 51.—GOATLING, BRITISH ALPINE.—Over one year, but not exceeding two years.—*First Prize* (£2 10s.) to Mrs. A. Abbey for “Didgemere Diadem.” *Second Prize* (£1 5s.) to Mrs. A. Abbey for “Didgemere Druidess.” *Third Prize* (15s.) to Miss M. Henderson for “Riding Thistle Fairy.”
- Class 52.—GOATLING, SAANEN OR BRITISH SAANEN.—Over one year, but not exceeding two years.—*First Prize* (£2 10s.) to Mrs. H. Maurice for “Ridgeway Runje.” *Second Prize* (£1 5s.) to Mrs. H. Maurice for “Ridgeway Runveyd.” *Third Prize* (15s.) to Mrs. A. Abbey for “Didgemere Destiny.”
- Class 53.—GOATLING, ANGLO-NUBIAN.—Entered in or eligible for entry in the Anglo-Nubian Section of the Herd Book.—Over one year, but not exceeding two years.—Cancelled.
- Class 54.—GOATLING, ANY OTHER VARIETY.—Not eligible for previous Classes.—Over one year, but not exceeding two years.—*First Prize* (£2 10s.) to Mrs. A. Abbey for “Didgemere Dhora” (British). *Second Prize* (£1 5s.) to Mrs. G. Templeman for “Lightwater Dhitie” (British).

CHEESE.

TROPHIES AND CUPS.

Open only to Stilton and Wensleydale.

THE LORD MAYOR'S CHAMPION CUP, value £10 10s. (presented by the CORPORATION OF THE CITY OF LONDON), for the best exhibit of Stilton or Wensleydale Cheese. Awarded to Miss I. McNair for Stilton.

Open only to Colonial Cheddar Cheese.

THE “HANSEN” CHALLENGE TROPHY, value £25 (presented by MESSRS. CHR. HANSEN'S LABORATORY, LTD.), for the best exhibit of Colonial Cheddar Cheese. Awarded to Edendale Co-operative Dairy Co.

Open only to Cheshire Cheese.

THE “FULLWOOD & BLAND” CHALLENGE CUP, value 20 Guineas, and £5 in cash (presented by MESSRS. R. J. FULLWOOD & BLAND), for the best exhibit of Cheshire Cheese. Awarded to W. E. Moore.

Open only to Smallholder Pressed Cheese.

THE “WALKER” CHALLENGE CUP (presented by Mr. E. G. F. WALKER) for the best exhibit of Cheese in Class 75. Awarded to Miss E. M. Madge.

A SILVER FRUIT DISH (presented by Mrs. A. S. McWILLIAM, M.B.E.) for the best exhibit in Class 76. Awarded to F. Portch.

Open to Hard Varieties except Stilton, Wensleydale, Cheddar and Cheshire.

THE LORD MAYOR'S CHAMPION CUP, value £10 10s. (presented by the CORPORATION OF THE CITY OF LONDON), for the best exhibit of Hard-pressed Cheese other than Stilton, Wensleydale, Cheddar and Cheshire. Awarded to Mrs. W. Haine for Double Gloster.

Class 55.—STILTON (6 Cheeses).—*First Prize* (£7) to Miss I. McNair. *Second Prize* (£4) to The Colston Bassett & District Dairy, Ltd. *Third Prize* (£2) to The United Dairies (Wholesale), Ltd., Swepstone.

- Class 56.—STILTON (18 Cheeses).—*First Prize* (£10 and Silver Medal) to Miss I. McNair. *Second Prize* (£5) to The Colston Bassett & District Dairy, Ltd. *Third Prize* (£3) to The United Dairies (Wholesale), Ltd., Swepstone.
- Class 57.—CHEDDAR TRUCKLES (6 Cheeses).—*First Prize* (£5) to B. Chinn. *Second Prize* (£3) to F. Portch. *Third Prize* (£1) to E. W. J. Marsh.
- Class 58.—CHEDDAR (4 Cheeses not less than 40 lbs. each).—*First Prize* (£7) to S. T. White. *Second Prize* (£4) to B. Chinn. *Third Prize* (£3) to A. H. Hunt. *Fourth Prize* (£2) to Mrs. Osborne & Sons.
- Class 59.—CHEDDAR (4 Cheeses, Long Keeping not less than 40 lbs. each, made on or before 30th June, 1928).—*First Prize* (£10) to S. T. White. *Second Prize* (£6) to C. M. Hallett. *Third Prize* (£4) to W. Cole. *Fourth Prize* (£2) to S. & J. Hunter.
- Class 60.—CHEDDAR (12 Cheeses).—*First Prize* (£15 and Silver Medal) to W. Goldie. *Second Prize* (£10) to S. T. White. *Third Prize* (£7) to W. Cruickshanks. *Fourth Prize* (£5) to Mrs. S. Colledge. *Fifth Prize* (£3) to T. Logan.
- Class 61.—COLONIAL CHEDDAR (2 Cheeses, Coloured or Uncoloured, not less than 60 lbs. each).—*First Prize* (Gold Medal) to Edendale Co-operative Dairy Co., New Zealand. *Second Prize* (Silver Medal) to Cardiff Co-operative Dairy Co., New Zealand. *Third Prize* (Bronze Medal) to Fairfax Co-operative Dairy Co., New Zealand.
- Class 62.—CHESHIRE (12 Cheeses).—*First Prize* (£15) and the "Robert Barbour" Prize (£5) to W. E. Moore. *Second Prize* (£10) to W. H. Hobson. *Third Prize* (£7) to F. Huntbach. *Fourth Prize* (£5) to O. Hesketh. *Fifth Prize* (£3) to P. H. Whalley.
- Class 63.—CHESHIRE (4 Coloured Cheeses, not less than 40 lbs. each).—*First Prize* (£7) to W. E. Moore. *Second Prize* (£4) to P. Fearnall. *Third Prize* (£2) to Mrs. J. Cummins.
- Class 64.—CHESHIRE (4 Uncoloured Cheeses, not less than 40 lbs. each).—*First Prize* (£7) to A. Barnett. *Second Prize* (£4) to W. E. Moore. *Third Prize* (£2) to J. Furber.
- Class 65.—CHESHIRE (4 Coloured Long Keeping Cheeses, not less than 40 lbs. each, made on or before 30th June, 1928). *First Prize* (£10) to T. E. Beckett. *Second Prize* (£6) to Cheshire School of Agriculture. *Third Prize* (£4) to T. E. Hughes. *Fourth Prize* (£2) to F. W. Hesketh.
- Class 66.—CHESHIRE (4 Cheeses, not less than 40 lbs. each).—Open only to those who have never won a Prize for Cheshire Cheese at any Show of the British Dairy Farmers' Association.—*First Prize* (£5) to J. H. Blake. *Second Prize* (£3) to P. V. Cooke. *Third Prize* (£2) to A. Barnett.
- Class 67.—FACTORY.—To be manufactured at and exhibited by a recognised Cheese Factory dealing with a minimum of 500 gallons of milk daily in the United Kingdom. (10 Cheeses, of not less than 28lbs. each, any Variety).—*First Prize* (£7) to Kilmaurs Dairy Association, Ltd. *Second Prize* (£4) to C. M. Hallett. *Third Prize* (£2) to Platt & Swain. *Fourth Prize* (£1) to Ruyton Co-operative Dairies, Ltd.
- Class 68.—LEICESTER (4 Cheeses).—*First Prize* (£4) to F. W. Tomlinson. *Second Prize* (£3) to Miss P. E. Richardson. *Third Prize* (£2) to J. Harrison.
- Class 69.—LANCASHIRE (4 Cheeses).—*First Prize* (£4) to J. Cowpe. *Second Prize* (£3) to S. Salthouse. *Third Prize* (£2) to W. Duckworth.
- Class 70.—DERBY (4 Uncoloured Cheeses, not less than 25 lbs. each).—*First Prize* (£4) to British Dairy Institute. *Second Prize* (£3) to J. M. Nuttall & Co., Ltd. *Third Prize* (£2) to Cheddar Valley Dairy Co., Ltd.
- Class 71.—DOUBLE GLOSTER (4 Cheeses, from 26 lbs. to 30 lbs. each, total weight not to exceed 120 lbs.).—*First Prize* (£4) to Mrs. W. Haine. *Second Prize* (£3) to G. Barnes. *Third Prize* (£2) to Cheddar Valley Dairy Co., Ltd.

- Class 72.—SINGLE GLOSTER (4 Cheeses, from 13 lbs. to 15 lbs. each, total weight not to exceed 60 lbs.).—*First Prize* (£4) to Mrs. W. Haine. *Second Prize* (£3) to F. Portch. *Third Prize* (£2) to G. Barnes.
- Class 73.—CAERPHILLY (4 Cheeses, not exceeding 8 lbs. each).—*First Prize* (£4) to J. E. L. Lewis. *Second Prize* (£3) to T. Wilkins. *Third Prize* (£2) to T. J. Collings.
- Class 74.—WENSLEYDALE (6 Blue-Moulded Cheeses).—*First Prize* (£4) to A. Rowntree & Son, Masham. *Second Prize* (£3) to A. Rowntree & Son, Coverham. *Third Prize* (£2) to British Dairy Institute.
- Class 75.—SMALLHOLDER PRESSED (2 Long Keeping Cheeses, not exceeding 8 lbs. each).—*First Prize* (£3) to Miss E. M. Madge. *Second Prize* (£2) to F. Portch. *Third Prize* (£1) to D. I. Banwell. *Fourth Prize* (10s.) to R. Luff.
- Class 76.—SMALLHOLDER PRESSED (2 Quick Ripening Cheeses, not exceeding 8 lbs. each).—*First Prize* (£3) to F. Portch. *Second Prize* (£2) to E. A. Cookson. *Third Prize* (£1) to J. Steward. *Fourth Prize* (10s.) to Cathedral Dairy.
- Class 77.—SMALL CHEDDAR (2 Cheeses, made at home, from 8 lbs. to 10 lbs. each). Open to Pupils who have attended County Travelling Cheese Schools during 1927 or 1928.—*First Prize* (£3) to A. Coleman. *Second Prize* (£2) to S. J. Wilcox. *Third Prize* (£1) to Miss J. Corson. *Fourth Prize* (10s.) to Miss M. Gumm.
- Class 78.—SMALL CHESHIRE (2 Cheeses, made at home, from 8 lbs. to 10 lbs. each). Open to Pupils who have attended County Travelling Cheese Schools during 1927 or 1928.—*First Prize* (£3) to J. Steward. *Second Prize* (£2) to Miss E. Witter. *Third Prize* (£1) to E. A. Cookson. *Fourth Prize* (10s.) to G. C. Hesketh.
- Class 79.—INTER-COUNTY COMPETITION (for the Best Collection of 8 Smallholder Cheeses not exceeding 8 lbs. each, made by four individual persons in their own dairies, and who have received instruction in Cheesemaking at a County Council Cheese School during 1925-1928).—*First Prize* (£10 and Challenge Shield) to Monmouthshire. Instructress, Miss M. M. Trippe. Competitors, Miss M. Baker, Miss J. Grimmer, Miss G. Mullins, Miss N. Rogers.
- Class 80.—CREAM (6 Cheeses of approximately 4 ozs. each, made from pure cream only, no milk or curd to be added).—*First Prize* (£1) to Sir Harold Mackintosh. *Second Prize* (10s.) to J. & T. Cash.
- Class 81.—UNRIPENED SORT (4 Cheeses of approximately 8 ozs. each, other than cream cheese, made direct from milk).—*First Prize* (£1) to Miss E. E. James. *Second Prize* (10s.) to East Anglian Institute of Agriculture.

COLLECTION OF PRODUCE.

- Class 82.—Open only to Women's Institutes. To consist of 2 lbs. Fresh Butter, 1 lb. of Cream (raw or scalded), and 2 dozen Eggs. The Collection to be packed in a box and sent to the Show by Parcel Post. Packages to be taken into consideration when making awards.—*First Prize* (£5) to Carbis Bay Women's Institute. *Second Prize* (£3) to Shifnal Women's Institute. *Third Prize* (£2) to Mylor Women's Institute.

BACON.

Cup, Open only to Bacon Pig Classes.

- THE "C. & T. HARRIS (CALNE) LTD." PERPETUAL CHALLENGE CUP presented by MESSRS. C. & T. HARRIS (CALNE) LTD., for the Four Best Sides of Wiltshire Bacon in any one entry in Classes 86, 87 or 88. Awarded to Country Breeding Estates, Ltd.

- Class 83.—FOUR SMOKED SIDES, Mild Cured in Wiltshire Style, with Ham attached.—*First Prize* (Silver Medal) to West Somerset Dairy and Bacon Co., Ltd.
Second Prize (Bronze Medal) to West Somerset Dairy and Bacon Co., Ltd.
- Class 84.—FOUR PALE DRIED SIDES, Mild Cured in Wiltshire Style, with Ham attached.—*First Prize* (Silver Medal) to Herts. & Beds. Bacon Factory.
Second Prize (Bronze Medal) to M. Venner & Sons, Ltd.
- Class 85.—TWO SIDES OF BACON SMOKED, TWO SIDES OF BACON PALE DRIED, TWO HAMS SMOKED, AND TWO HAMS PALE DRIED (the weight of the sides not less than 56 lbs. and not more than 68 lbs. each: the Hams not less than 12 lbs. and not more than 20 lbs. each).—*First Prize* (Gold Medal) to M. Venner & Sons, Ltd. *Second Prize* (Silver Medal) to J. R. Johnson & Son. *Third Prize* (Bronze Medal) to Herts. & Beds. Bacon Factory.
- Class 86.—BACON PIGS (3 hogs and 3 gilts, farrowed on or after 1st March, 1928, by a registered sire out of a registered dam of the same breed, entered by their respective Breed Societies or Breeders). *First Prize* (£12 and The "Whitley" Challenge Cup) to A. Lewis. *Second Prize* (£6) to Chivers & Sons, Ltd. *Third Prize* (£3) to J. P. Morgan.
- Class 87.—BACON PIGS, PEDIGREE (1 hog and 1 gilt, farrowed on or after 1st March, 1928, by a registered sire out of a registered dam of the same breed).—*First Prize* (£5 and the "Beale" Challenge Cup) to Chivers & Sons, Ltd. (Large White). *Second Prize* (£3) to Bennett & Howard (Gloucestershire Old Spots). *Third Prize* (£2) to J. P. Morgan (Large White).
- Class 88.—BACON PIGS.—FIRST CROSS (1 hog and 1 gilt, farrowed on or after 1st March, 1928, by a pure bred sire and out of a pure bred dam).—*First Prize* (£5 and the "Bledisloe" Bacon Challenge Cup) to Country Breeding Estates, Ltd. (Large White and Large Black). *Second Prize* (£3) to J. H. Ismay (Large White and Berkshire). *Third Prize* (£2) to H. H. Pickford (Large White and Large Black).
- Class 89.—COLONIAL (4 sides suitable for the London Market).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to The Farmers' Co-operative Bacon Factory, Ltd., South Africa.

HAMS.

- Class 90.—FOUR PALE DRIED (long cut, of Winter or Spring cure, not over 14 lbs. weight).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to W. H. Smart & Co., Ltd.
- Class 91.—FOUR PALE DRIED (long cut, of Winter or Spring cure, over 14 lbs. weight).—*First Prize* (Silver Medal) to W. H. Smart & Co., Ltd. *Second Prize* (Bronze Medal) to J. A. Hunter & Co., Ltd.
- Class 92.—FOUR SMOKED (long cut, mild cured, not over ten weeks cured, not over 15 lbs. weight).—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to W. H. Smart & Co., Ltd.
- Class 93.—FOUR PALE DRIED (long cut, mild cured, not over ten weeks cured, over 15 lbs. weight).—*First Prize* (Silver Medal) to M. Venner & Sons, Ltd. *Second Prize* (Bronze Medal) to J. A. Hunter & Co., Ltd.
- Class 94.—SELLING CLASS FOR TWO HAMS, ANY VARIETY.—*First Prize* (£2), and *Third Prize* (10s.) to W. H. Smart & Co., Ltd. *Second Prize* (£1) to Marsh & Baxter, Ltd.

BUTTER.

Cup for 2-lb. Butter Classes.

THE LORD MAYOR'S CHAMPION CUP, value £10 10s. (presented by the CORPORATION OF THE CITY OF LONDON), for the best exhibit of Butter in Classes 95 to 100 inclusive. Awarded to J. Northcott.

- Class 95.—SLIGHTLY SALTED. (Open only to farmers, their wives, sons and daughters, occupying not exceeding 100 acres, and who have never won a prize in the Butter Classes at any of the Association's Shows; 2 lbs. in 1 lb. lumps, brick shape).—*First Prize (£3) to H. J. E. Price. Second Prize (£2) to Mrs. W. H. Hutchins. Third Prize (£1) to Mrs. A. Reynolds.*
- Class 96.—PERFECTLY FREE FROM SALT (the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1 lb. lumps, brick shape).—*First Prize (£3) to J. Northcott. Second Prize (£2) to Mrs. L. Matthews. Third Prize (£1) to Miss K. Rogers. Fourth Prize (10s.) to Miss L. T. Hare. Fifth Prize (5s.) to Mrs. L. T. Morris.*
- Class 97.—SLIGHTLY SALTED (the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1 lb. lumps, brick shape).—*First Prize (£3) to Mrs. S. Harding. Second Prize (£2) to J. Northcott. Third Prize (£1) to Mrs. E. Hill. Fourth Prize (10s.) to Admiral Sir R. Phillimore. Fifth Prize (5s.) to Mrs. P. Roach.*
- Class 98.—PERFECTLY FREE FROM SALT (the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1 lb. lumps, brick shape).—*First Prize (£3) to J. Northcott. Second Prize (£2) to Mrs. J. Way. Third Prize (£1) to Mrs. E. Cowling. Fourth Prize (10s.) to Miss B. J. Mudd. Fifth Prize (5s.) to Miss A. Bray.*
- Class 99.—SLIGHTLY SALTED (the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1 lb. lumps, brick shape).—*First Prize (£3) to J. Northcott. Second Prize (£2) to Miss K. Rogers. Third Prize (£1) to Miss B. J. Mudd. Fourth Prize (10s.) to Mrs. J. Way. Fifth Prize (5s.) to Mrs. E. Cowling.*
- Class 100.—SLIGHTLY SALTED, to be made from Scalded Cream only (2 lbs. in 1 lb. lumps, brick shape).—*First Prize (£3) to Mrs. E. Hill. Second Prize (£2) to J. Northcott. Third Prize (£1) to Miss L. T. Hare. Fourth Prize (10s.) to Mrs. G. Blackler.*
- Class 101.—SLIGHTLY SALTED (12 lb. boxes of 12 bricks).—*First Prize (£3) to Ardagh Co-operative Dairy Society, Ltd. Second Prize (£2) to Newport Co-operative Dairy Society, Ltd. Third Prize (£1) to Solohead Co-operative Agricultural & Dairy Society, Ltd. Fourth Prize (10s.) to Ballinfull Co-operative Dairy Society, Ltd.*
- Class 102.—FREE FROM SALT (24 lb. boxes of 12 rolls).—*First Prize (£3) to Ardagh Co-operative Dairy Society, Ltd. Second Prize (£2) to Newport Co-operative Dairy Society, Ltd., Third Prize (£1) to Bruree Co-operative Creamery, Fourth Prize (10s.) to Solohead Co-operative Agricultural & Dairy Society, Ltd.*
- Class 103.—MILD CURED (slightly salted, in 24 lb. boxes of 24 rolls).—*First Prize (£3) to Newport Co-operative Dairy Society, Ltd. Second Prize (£2) to Centenary Co-operative Creamery, Ltd. Third Prize (£1) to Shanagolden Co-operative Dairy Society, Ltd. Fourth Prize (10s.) to Glin Co-operative Dairy Society, Ltd.*
- Class 104.—CURED (slightly salted, 28 lbs.).—*First Prize (£3) to Drumcliffe Co-operative Creamery Ltd. Second Prize (£2) to Ardagh Co-operative Dairy Society, Ltd. Third Prize (£1) to Thurles Co-operative Creamery, Ltd. Fourth Prize (10s.) to Garryspillane Co-operative Dairy Society.*
- Class 105.—CURED (56 lbs.).—*First Prize (£3) to Centenary Co-operative Creamery, Ltd. Second Prize (£2) to Solohead Co-operative Agricultural & Dairy Society, Ltd. Third Prize (£1) to Bruree Co-operative Creamery. Fourth Prize (10s.) to Mounneabbey Co-operative Dairy Society, Ltd.*
- Class 106.—TWO POUNDS, made up in the most attractive form for table use.—*First Prize (£3) to Mrs. R. J. Dunstan. Second Prize (£2) to Miss P. L. Mudd. Third Prize (£1) to Miss M. N. Blackman.*

Class 107.—FANCY OR ORNAMENTAL DESIGN, with foliage or other extraneous decoration.—*First Prize* (£5) to Miss P. L. Mudd. *Second Prize* (£3) to Miss B. J. Mudd. *Third Prize* (£2) to Miss A. M. Ward. *Fourth Prize* (£1) to Mrs. F. W. Bromfield.

COLONIAL BUTTER.

Class 108.—SALTED (56 lbs.).—*First Prize* (Gold Medal) to Candelo Co-operative Dairy Co., Australia. *Two Second Prizes* (Silver Medals) to Comboyne Rural Co-operative Society, Ltd., Australia, and Gloucester Dairy Co., Ltd., Australia. *Two Third Prizes* (Bronze Medals) to South Australian Farmers' Co-operative Union, Ltd., Naracoorte, Australia, and Gayndah Co-operative Dairy Association, Ltd., Australia.

Class 109.—UNSALTED (56 lbs.).—*First Prize* (Gold Medal) to Oakey District Co-operative Butter Association, Ltd., Australia. *Two Second Prizes* (Silver Medals) to Maryborough Co-operative Dairy Association, Ltd., Kingaroy, Australia, and South Wolumla Co-operative Dairy Co., Australia. *Two Third Prizes* (Bronze Medals) to Downs Co-operative Dairy Co., Australia, and Shannon Co-operative Dairy Co., Australia.

COLLECTION OF COLONIAL DAIRY PRODUCE.

Class 110.—To include Bacon, Dead Poultry and Eggs.—No Entry.

CREAM.

Class 111.—CLOTTED.—*First Prize* (£2 2s. and Silver Medal) to Mrs. J. H. Spear. *Second Prize* (£1 1s. and Bronze Medal) to Miss K. Rogers.

Class 112.—OTHER THAN CLOTTED.—*First Prize* (£2 2s. and Silver Medal) to Hammetts Dairies, Ltd. *Second Prize* (£1 1s. and Bronze Medal) to Miss Jessie Seldon.

BOTTLED FRUITS, VEGETABLES AND JAMS.

SILVER MEDAL for the best exhibit in Classes 113 to 122 awarded to Mrs. K. Davies.

Class 113.—SIX BOTTLES OF SOFT FRUIT, of not less than 4 Varieties (Rhubarb admitted).—*First Prize* (£2) to Miss D. E. Williams. *Second Prize* (£1) to Mrs. K. Davies. *Third Prize* (10s.) to Mrs. C. Yates.

Class 114.—SIX BOTTLES OF STONE FRUIT, of not less than 4 Varieties (Apples and Pears admitted).—*First Prize* (£2) to Mrs. K. Davies. *Second Prize* (£1) to Miss D. E. Williams. *Two Equal Third Prizes* (10s.) each to Mrs. L. Rotherfield and Mrs. C. Yates.

Class 115.—SIX BOTTLES OF FRUIT, SOFT AND STONE, of not less than 2 Varieties of each. To be shown in bottles suitable for trade. Price of bottles, without contents to be placed on one bottle.—Cancelled.

Class 116.—THREE BOTTLES OF SOFT FRUIT, distinct.—*First Prize* (£1) to Miss D. E. Williams. *Second Prize* (10s.) to Mrs. K. Davies. *Third Prize* (7s. 6d.) to Mrs. L. B. Turney.

Class 117.—THREE BOTTLES OF STONE FRUIT, distinct.—*First Prize* (£1) to Mrs. K. Davies. *Second Prize* (10s.) to Miss D. E. Williams. *Third Prize* (7s. 6d.) to Mrs. L. B. Turney.

Class 118.—THREE BOTTLES OF STONE OF SOFT FRUIT, distinct. Preserved in Syrup.—*First Prize* (£1) Not awarded. *Second Prize* (10s.) to Miss E. A. Smith. *Third Prize* (7s. 6d.) to Cathedral Dairy.

Class 119.—SIX BOTTLES OF VEGETABLES, of not less than 4 Varieties (Tomatoes admitted).—Cancelled.

Class 120.—THREE BOTTLES OF VEGETABLES, distinct.—*First Prize* (£1) to Miss D. E. Williams. *Second Prize* (10s.) to Miss K. M. Barbary.

Class 121.—THREE JARS OF JAM (1 lb. each, dissimilar, any Variety).—*First Prize* (£1) to Miss D. E. Williams. *Second Prize* (10s.) to Mrs. K. Davies. *Third Prize* (7s. 6d.) to Cathedral Dairy.

Class 122.—CO-OPERATIVE EXHIBIT OF BOTTLED FRUITS, VEGETABLES, JAMS, FRUIT JELLIES, PICKLES AND CHUTNEYS. Open only to Women's Institutes, and no one Member to contribute more than two items in the exhibit. To consist of 3 bottles of Soft Fruit, 3 bottles of Stone Fruit, 3 bottles of Vegetables, 3 1 lb. jars of Jam or Fruit Jelly, 3 jars of Pickles or Chutney. All exhibits to be shown in glass containers and to be of not less than two Varieties.—*First Prize* (£5) to Copthorne Women's Institute. *Second Prize* (£3) to Pendleton Women's Institute. *Third Prize* (£2) to Frensham Women's Institute.

HONEY, WAX, &c.

Class 123.—SIX JARS OF EXTRACTED LIGHT-COLOURED HONEY (1 lb. each, approximate weight).—*First Prize* (£1) to J. D. Ward. *Second Prize* (15s.) to A. Magson. *Third Prize* (12s. 6d.) to E. H. Josling. *Fourth Prize* (10s.) to E. Pragnell.

Class 124.—SIX JARS OF EXTRACTED MEDIUM-COLOURED HONEY, excluding Heather Honey (1 lb. each, approximate weight). *First Prize* (£1) to H. R. Harris. *Second Prize* (15s.) to Capt. C. F. Dixon-Johnson. *Third Prize* (12s. 6d.) to E. G. Bastable. *Fourth Prize* (10s.) to W. J. Goodrich.

Class 125.—SIX JARS OF EXTRACTED DARK-COLOURED HONEY, excluding Heather Honey (1 lb. each, approximate weight).—*First Prize* (£1) to A. E. Warren. *Second Prize* (15s.) to Capt. C. F. Dixon-Johnson. *Third Prize* (12s. 6d.) to W. Bennett. *Fourth Prize* (10s.) to A. Magson.

Class 126.—SIX JARS OF GRANULATED HONEY, excluding Heather Honey (1 lb. each, approximate weight).—*First Prize* (£1) to A. H. Bowen. *Second Prize* (10s.) to A. E. Warren. *Third Prize* (7s. 6d.) to W. J. Goodrich.

Class 127.—SIX SECTIONS OF COMB HONEY, excluding Heather Honey (size $4\frac{1}{2}$ by $4\frac{1}{2}$, approximate weight, 1 lb. each).—*First Prize* (£1) to Summertree Bee Farm. *Second Prize* (15s.) to E. Pragnell. *Third Prize* (10s.) to Dr. H. French.

Class 128.—DISPLAY OF HONEY AND HONEY PRODUCTS, in any form, staged on space not exceeding 4 ft. by 4 ft. maximum height to be about 4 ft. above the table. The gross weight to be stated. No entry.

Class 129.—ONE SHALLOW-FRAME OF COMB HONEY, suitable for extracting.—*First Prize* (15s.) to F. A. Kent. *Second Prize* (10s.) to Miss I. H. Jackson.

Class 130.—BEES' WAX, not less than 2 lbs. in not more than two cakes, the produce of the Exhibitor's apiary; extracted and cleaned by the Exhibitor or his assistants.—*First Prize* (15s.) to H. P. Young. *Second Prize* (10s.) to D. & J. Lindsay. *Third Prize* (7s. 6d.) to A. E. Warren.

Class 131.—INTERESTING AND INSTRUCTIVE EXHIBIT OF A PRACTICAL OR SCIENTIFIC NATURE CONNECTED WITH BEE CULTURE, not mentioned in the foregoing classes.—*First Prize* (15s.) to E. Bliss for improved appliance for bee-hives. *Second Prize* (10s.) to E. G. Bastable.

Class 132.—THREE VESSELS OF COLONIAL EXTRACTED HONEY, as imported.—*First Prize* (Silver Medal) and *Second Prize* (Bronze Medal) to Ontario Beekeeper's Association.

ROOTS.

- Class 133.—SIX SPECIMENS OF GLOBE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to D. Jervis. *Second Prize* (£2) to R. Thomas. *Third Prize* (£1) to W. Jones.
- Class 134.—SIX SPECIMENS OF INTERMEDIATE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to H. Bennett. *Second Prize* (£2) to J. Richards. *Third Prize* (£1) to D. Thomas.
- Class 135.—SIX SPECIMENS OF SWEDES, PURPLE TOP, drawn from a crop of not less than two acres.—*First Prize* (£3) to D. Thomas. *Second Prize* (£2) to J. James. *Third Prize* (£1) to J. Richards.
- Class 136.—SIX SPECIMENS OF SWEDES, BRONZE TOP OR GREEN TOP, drawn from a crop of not less than two acres.—*First Prize* (£3) to G. Whalley. *Second Prize* (£2) to W. Peace. *Third Prize* (£1) to D. Jervis.
- Class 137.—SIX SPECIMENS OF TURNIPS, WHITE-FLESHED, drawn from a crop of not less than two acres.—*First Prize* (£3) to J. H. Hedley. *Second Prize* (£2) to R. Paterson. *Third Prize* (£1) to D. Thomas.
- Class 138.—THREE SPECIMENS OF CABBAGE, drawn from a crop of not less than two acres.—*First Prize* (£3) to F. S. Mee. *Second Prize* (£2) to G. Gadsby. *Third Prize* (£1) to P. Perry.
- Class 139.—COLLECTION OF ROOTS, &c., FOR CATTLE FEEDING IN WINTER (to consist of six specimens of not exceeding ten Varieties, in as many distinct types as possible).—*First Prize* (£5) to J. James. *Second Prize* (£3) to P. Perry. *Third Prize* (£2) to J. M. Roberts.

INVENTIONS.

- Class 140.—ANY NEW APPARATUS OR INVENTION RELATING TO THE DAIRY INDUSTRY, OR ONE SHOWING DISTINCT AND PRACTICAL IMPROVEMENT, ESPECIALLY AS TO SAVING OF LABOUR, not eligible for competition in any other Class and not previously exhibited in competition at the Dairy Show.—Bronze Medal to Gascoignes (Reading), Ltd., for "Gascoigne Perfection Milking Machine."
- Class 141.—BOTTLE-WASHING MACHINE, suitable for large city dairies, with a maximum capacity of at least 20,000 sterile bottles per working day. *First Prize* (£3 and Silver Medal) to R. W. Webster & Co., Ltd.
- Class 142.—REFRIGERATING COMPRESSOR PLANT, capable of cooling milk from 100 deg. F. to 40 deg. F., at the rate of 50 gallons an hour. Suitable for farmers with herds of 30 to 50 cows. Cost to be taken into consideration. No award.

JUNKET-MAKING CONTESTS.

- Class 143.—JUNKET MADE WITH CREAM AND MILK. Open only to those who have never won a First Prize for Junket-making at any Shows of the British Dairy Farmers' Association.
- SECTION A.—*First Prize* (£2) to Mrs. R. J. Dunston. *Second Prize* (£1) to Miss D. Cane. *Third Prize* (10s.) to Miss D. E. Nicholas.
- SECTION B.—*First Prize* (£2) to Miss V. L. Turner. *Second Prize* (£1) to Mrs. M. Pooley. *Third Prize* (10s.) to Miss A. T. Sherwill.
- SECTION C.—*First Prize* (£2) to Miss N. Simmons. *Second Prize* (£1) to Miss M. O. Oatey. *Third Prize* (10s.) to Miss B. J. Mudd.
- Class 144.—CHAMPION CONTEST. Open to First Prize Winners in preceding sections and at previous Shows of the British Dairy Farmers' Association, Champions of any year excepted.—*Prize* (Silver Medal) to Miss V. L. Turner.

BUTTER-MAKING CONTESTS.

Class 145.—Open to those who have never won a Prize at any Show wherever held.

SECTION A.—*First Prize* (£3) to Miss M. O. Oatey. *Second Prize* (£2) to Miss J. K. Cruddas. *Third Prize* (£1) to Miss R. Spence.

SECTION B.—*First Prize* (£3) to Miss M. E. Davies. *Second Prize* (£2) to Miss T. Morris. *Third Prize* (£1) to Miss A. T. M. Asser.

Class 146.—Open to Students who have attended Classes at the British Dairy Institute, Reading, for not less than one month during the past two years.—*First Prize* (£3) to Miss M. L. Hopson. *Second Prize* (£2) to E. R. Hodges. *Third Prize* (£1) to Miss B. C. Beamond.

Class 147.—Open Contest for Men and Women who have never won a First Prize at any Show of the British Dairy Farmers' Association.

SECTION A.—*First Prize* (£3) to Miss K. Davis. *Second Prize* (£2) to Miss L. C. Ball. *Third Prize* (£1) to Miss P. L. Mudd.

SECTION B.—*First Prize* (£3) to Miss C. M. Yarnold. *Second Prize* (£2) to Mrs. H. James. *Third Prize* (£1) to Miss E. Llewellyn.

SECTION C.—*First Prize* (£3) to Miss E. L. Tunkiss. *Second Prize* (£2) to Miss M. Morris. *Third Prize* (£1) to Mrs. A. Morgan.

Class 148.—Open to Winners of First Prizes in Classes 145, 146 and 147.—*First Prize* (£3 and Silver Medal) to Miss K. Davis. *Second Prize* (£2) to Miss C. M. Yarnold. *Third Prize* (£1) to Miss M. E. Davies.

Class 149.—CHAMPION CONTEST. Open to Winners of First Prizes in Classes 145 to 147 and at any of the last five Shows of the British Dairy Farmers' Association. Champions of any year excepted.—*First Prize* (Gold Medal) to Miss R. E. Mitchell. *Second Prize* (£3) to Miss R. Hancock. *Third Prize* (£2) to Miss R. M. Gwillim.

MILKERS' CONTESTS.

Class 150.—Open to Men and Women of 18 years and over.—*First Prize* (£7) to T. W. Parton. *Second Prize* (£4) to A. F. Beard. *Third Prize* (£3) to A. J. Barnett. *Fourth Prize* (£2) to Miss D. Lloyd. *Fifth Prize* (£1) to J. Eggleston, Jnr.

Class 151.—Open to Boys and Girls under 18 years.—*First Prize* (£7) to R. M. Peacock. *Second Prize* (£4) to Miss M. Miller. *Third Prize* (£3) to W. T. Challoner. *Fourth Prize* (£2) to Miss B. Harries. *Fifth Prize* (£1) to J. King.

Class 152.—CHAMPION CONTEST. Open to Winners of First Prizes in Classes 150 and 151 and at any of the last three Shows of the British Dairy Farmers' Association. Champions of any year excepted.—*Prize* ("Howard" Cup, Gold Medal and £2) to R. M. Peacock.

COW-JUDGING CONTEST.

Class 153.—Open to Teams of Students from Agricultural Colleges, Farm Institutes, and County Council Classes.—*Prize* (B.D.F.A. Challenge Cup and Silver Medal) to Cornwall County Council, and Bronze Medals to W. E. Bowden, L. Daniel and M. L. James.

THE OBJECTS OF THE BRITISH DAIRY FARMERS' ASSOCIATION

are the improvement of

DAIRY STOCK AND DAIRY PRODUCE,

by encouraging the Breeding and Rearing of Stock for the special purpose of the Dairy; a larger and better production of Milk, Butter, Cheese, and Eggs; the Erection of Improved Dairy Buildings, and the Invention of New or Improved Dairy Utensils, Machinery, Implements, and Scientific Appliances. The Association also stimulates the Breeding and Rearing of Poultry, &c. By means of Papers in the Society's *Journal* (published annually), Annual Conferences in different dairy districts, Lectures, and Discussions, and in other ways, efforts are continually being made to disseminate a more thorough knowledge of Dairy husbandry. Moreover, prompt action is taken by the Association for the protection of the interests of Dairy Farmers in the event of their being threatened by legislation or by Departmental Orders.

Prizes to the value of about £3,500 are annually offered for competition at the Dairy Show, held at the Royal Agricultural Hall, Islington, London.

It is difficult to over-estimate the importance and need of greater attention being paid to the Dairy industry. It is admitted that by improved modes of managing Milk and its products, the wealth obtained from the Milch Cows of the country could be increased most materially. The Council, therefore, appeal to Agriculturists of all classes, and Dairy Farmers in particular, to become Members of the Association, and practically aid in developing its usefulness.

The advantages of Membership comprise :—

- 1.—A free pass to all the Society's Dairy Shows, available each day during the Exhibition, with the privilege of admitting free (by ticket) a friend on any one day.
- 2.—The privilege of participating, at specially low charges, in the Dairy Conferences organised by the Association at home or abroad.
- 3.—The Exhibition of Live Stock, Dairy Produce, and Utensils (for competition) at a reduced scale of fees to Life Members, and to Annual Members subscribing £1 per annum whose subscription for the past year and current year is paid. A reduction of 10 per cent. is allowed to Standholders whose Membership is of 3 years standing.
- 4.—A copy (free by post) of the *Journal* of the Association, published annually.
- 5.—Analyses by the Analytical and Consulting Chemist, at low fees, of samples of milk, cream, butter, cheese, feeding stuffs, water, soil, manures, &c., and advice on dairy matters connected with his Department.

- 6.—Bacteriological examination of dairy produce, &c., at reduced fees.
- 7.—Examinations by the Consulting Pathological Bacteriologist for particular pathogenic or disease-producing organisms.
- 8.—Professional advice and assistance at a reduced scale of charges in any case of disease among the live stock of the farm.
- 9.—In any case of apparent hardship in connection with the administration of the Model Milk Clauses, Members are recommended to at once send details of such case to the Secretary, who will submit the matter to the Committee appointed to deal with such matters, after which advice and assistance will be given by the Association.

The Annual Subscription is £1, but Dairy Instructors and Students and full-time Secretaries and Recorders of Milk Recording Societies are admitted on payment of 10s. 6d. per annum. The latter sum entitles Members to all privileges, except the reduced fees for exhibition at the Shows. Life Membership, £15.

Members' Chemical Privileges.

Free Analysis.—Each member, whose subscription for the current year is paid, is entitled to one analysis of a dairy product (paragraphs 1 to 9 below) free of charge. A stamped addressed envelope must be forwarded with the sample for the return of the report of the analysis.

Further analyses will be made by the Association's Consulting Chemist at the following reduced fees:—

1.—MILK (Fresh).					£	s.	d.
Estimation of Fat and Total Solids...	...	...	...	...	0	1	0
Estimation of Fat, Casein, Albumen, Sugar, and Ash	...	...	...	...	0	10	0
2.—MILK (Sour).							
Estimation of Fat and Total Solids	...	...	...	...	0	5	0
3.—SKIMMED MILK.							
Estimation of Fat and Total Solids...	...	...	...	...	0	5	0
4.—CONDENSED MILK.							
Estimation of Fat	...	...	...	...	0	5	0
Estimation of Fat, Casein, and Solids	...	...	...	...	0	10	0
Estimation of Cane Sugar (extra)	...	...	...	...	0	5	0
5.—HUMANISED MILK.							
Complete Analysis	...	...	...	...	1	1	0
6.—CREAM.							
Estimation of Fat	...	...	...	...	0	5	0
Estimation of Fat, Casein, and Solids	...	...	...	...	0	12	6
Examination for Foreign Fats (extra)	...	...	...	...	0	10	6
7.—BUTTER.							
Estimation of Water, Fat, Casein, and Ash	...	...	...	...	0	10	0
Examination for Foreign Fats (extra)	...	...	...	...	0	10	6
8.—CHEESE.							
Estimation of Water, Fat, Casein, and Ash	...	...	...	...	0	10	6
Examination for Foreign Fats (extra)	...	...	...	...	0	10	0
9.—RENNET.							
Examination of Strength	...	...	...	...	0	5	0

						£	s.	d.
10.—CAKES AND MEALS.								
Estimation of Oil only						0	5	0
Estimation of Oil, Albuminoids, Carbo-hydrates, &c.						0	15	0
11.—GRASS, SILAGE, ROOTS, &c.								
Estimation of Oil, Albuminoids, Carbo-hydrates, &c.						1	10	0
12.—MANURES.								
Estimation of Soluble Phosphoric Acid						0	5	0
Estimation of Soluble and Insoluble Phosphoric Acid						0	7	6
Estimation of Citric Soluble Phosphoric Acid						0	7	6
Estimation of Nitrogen						0	5	0
Estimation of Potash						0	7	6
13.—SOIL.								
Estimation of Lime						0	5	0
Analysis and Report						2	2	0
14.—WATER.								
Analysis for Drinking or Dairy Purposes						1	1	0
15.—POISONS.								
Examination of a Substance for Mineral Poisons						2	2	0
Examination for Organic Poisons (Alkaloids, &c.)						3	3	0
16.—CIDER AND FERMENTED DRINKS.								
Estimation of Alcohol						0	7	6
Estimation of Alcohol, Sugar, Acidity, &c.						0	15	0
17.—PRESERVATIVES.								
Examining a Substance for Boracic Acid or Salicylic Acid, &c., for each Substance sought						0	2	6
Estimation of the quantity of Boracic Acid						0	10	6
18.—CONSULTATION.								
For Letter in reply to Enquiry						Free		
For Report on a Subject						0	7	6
For Personal Interview						0	10	6
For Special Consultation						1	1	0

NOTE.—The Consulting Chemist will be prepared to quote reduced terms to members requiring a number of analyses at frequent intervals.

Instructions for Taking Fair Samples for Analysis.

Dairy Produce.—Milk should be sent in a well-corked 8-oz. clear bottle. The milk should quite fill the bottle. Butter or cheese, about 8 ounces; the former in a gallipot well tied down.

Soils.—A block of soil about four or five inches square, and nine inches deep, should be sent in a strong box by rail.

Artificial Manures.—Take a handful of manure out of at least half a dozen bags, mix these rapidly and thoroughly, breaking down all lumps. Forward about a pound of the mixture in a tin box, and retain the remainder. Samples of manure should be sent immediately after the delivery of the bulk, and before settling the account. All manures should be bought subject to analysis.

Feeding Materials.—Feeding cakes, meals, or grains: about a pound should be sent in a bag or box. Grass and hay: a bundle of a few pounds weight. Silage: a six-inch cubic block, packed closely in a box to keep it compressed.

Waters.—A Winchester quart glass-stoppered bottle should be procured from a druggist, well washed out with the water, then completely filled, the stopper tied securely down, and the bottle packed in a box and sent by rail.

N.B.—In order to prevent disappointment, the Chemist requests that, as far as possible, Members desiring to hold a personal consultation should make an appointment by letter. Between 10 and 4 are the hours most convenient. The fees for analyses of artificial manures and feeding stuffs are only applicable to Members who are not commercially engaged in their manufacture or sale. All communications intended for the Analytical and Consulting Chemist must be addressed direct to Dr. T. J. DRAKELEY, Ph.D., M.Sc., F.I.C., F.C.S., M.I.M.E., 28, Russell Square, London, W.C.1.

Members' Bacteriological Privileges.

Samples of dairy produce, &c., submitted for a bacteriological count, or for examination for *Bacillus Coli*, &c., should be forwarded to Dr. T. J. DRAKELEY, Ph.D., M.Sc., F.I.C., F.C.S., M.I.M.E., 28, Russell Square, W.C.1.

Examinations will be made at the following fees:—

MILK.	£	s.	d.
Bacteriological Examination of "Certified," "Grade A," or "Pasteurised" Milk under the Milk (Special Designations) Order, 1922	0 10 6
Cultural Examination for a particular organism	2 2 0
CREAM, BUTTER, CHEESE.			
Cultural Examination for a particular organism	2 2 0

Directions for Sending Samples.

Samples of milk (one pint) and cream (half pint) should be forwarded in wide-mouthed stoppered bottles which have previously been thoroughly cleaned, and then rinsed several times with very hot, almost boiling, water.

Butter is best sent in a $\frac{1}{2}$ -lb. brick or roll, just as it was made up, wrapped in grease-proof paper, and packed in a box.

If the *Cheese* is small, send a whole one: otherwise forward a square block of not less than one pound, and not a wedge-shaped piece. Wrap in grease-proof paper and pack in a box.

Members' Botanical Privileges.

The Council have fixed the following rates of charge for the examination of Plants and Seeds for the *bonâ fide* and individual use and information of Members of the Association (not being Seedsmen), who are particularly requested to mention the kind of examination they require, *and to quote its number in the subjoined Schedule.*

No.	£	s.	d.
1.—A Report on the purity, and amount or nature of foreign materials, of a sample of seed	0	1	0
2.—A Report on the perfectness and germinating power of a sample of seed	0	1	0
Nos. 1 and 2 together	0	1	6
3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention	0	1	0
4.—Report on any disease affecting farm crops	0	1	0
5.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value	0	4	0

Instructions for Selecting and Sending Samples.

The utmost care must be taken to secure a fair honest sample. When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. Grass seeds should be sent at least four weeks, and clover seeds two weeks before they are to be used. In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel. Specimens of diseased plants or of parasites should be forwarded as fresh as possible—either in a bottle, or packed in tinfoil or oil silk. All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstance (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

The charge for examination must be paid, in Postage Stamps or otherwise, at the time of application, and the carriage of all parcels must be prepaid. It must be distinctly understood that *no notice can be taken* of any application unless it is accompanied by the proper fee.

THE BRITISH DAIRY INSTITUTE, READING.

THE British Dairy Institute was established at Aylesbury in 1888, by the British Dairy Farmers' Association, and several hundred Students were successfully trained there in different branches of dairy work. In order that Students might have an opportunity of combining with the practical study of dairying a more complete scientific instruction, the Institute was, in 1896, moved to Reading, and placed under the management of a Committee representing the British Dairy Farmers' Association and the University College, Reading.

The Institute contains large milk-receiving, buttermaking, and milk-testing rooms; rooms for the manufacture of pressed, unpressed, and soft cheeses; and rooms for the ripening and drying of different varieties of cheese; besides reading, lecture, and common rooms. It is equipped with the best modern apparatus for the manufacture of dairy produce, including power-driven separating and buttermaking plant, and cold storage plant.

The instruction given is both practical and theoretical, and is arranged to suit the requirements of those who need either elementary or advanced dairy instruction, or who wish to perfect themselves in the manufacture of any special variety of dairy produce. Instruction is provided for students who wish to specialize in Bacteriology or Chemistry applied to dairying.

The Institute is open throughout the year, except during the Winter Vacation of eight weeks, which commences about the middle of November.

The Courses at the Institute are open to men and women above the age of 16 years. Students may join at any time while the Institute is open, and for any period not less than a week, but those who desire to take a thorough short course in buttermaking or cheesemaking are recommended to attend the Six Months' or Three Months' Joint Course in Dairying.

The manufacture of hard-pressed and soft cheeses is taught during the whole of the time when the Institute is open, but Stilton and other blue-veined varieties are not made until May.

Instruction is given in buttermaking, clotted-cream making, the testing and analysis of milk, the management of various types of separators, the handling and care of milk, and the preparation of starters, &c. Lectures and demonstrations are usually given in the afternoons, the mornings being chiefly devoted to practical dairy work.

Practical and theoretical instruction in buttermaking and cheesemaking (including hard-pressed, blue-veined, and soft cheese), £1 per week; £10 for three months; £18 for six months.

Practical and theoretical instruction in buttermaking only, 10s. per week (or part of week).

A full Prospectus will be sent on application to the Secretary, British Dairy Institute, Reading.

FRED J. BULL

Secretary, B.D.F.A.

28, Russell Square, London, W.C. 1.

Fifty-third Half-yearly Report of the Council presented to the Members at the Meeting held at the Dairy Show, Royal Agricultural Hall, Islington, N. 1, on Wednesday, October 24th, 1928.

YOUR Council has, with the deepest regret, to preface the 53rd Half-yearly Report by recording the great loss which has been sustained by the decease of Mr. C. W. Walker-Tisdale and Lt.-Col. E. W. Caddick. Mr. C. W. Walker-Tisdale joined the Association in 1901 and was appointed to a seat on the Council in 1912. He had, on many occasions, acted as a Judge and Steward at Dairy Shows and examined many candidates for the Association's Diploma, Buttermaking and Cheese-making Certificates. Lt.-Col. E. W. Caddick became a member in 1898, was elected to the Council in 1904, and for many years acted as a Steward of Produce at the Dairy Show. The loss will be severely felt and the Council experienced difficulty in appointing a successor.

Mr. E. G. Harding and Capt. W. A. Nell have been elected to fill the vacancies.

Whilst the membership roll has lengthened there is still unlimited room for expansion. At this Jubilee Show it is the Council's ambition to announce that the 2,000 mark has been reached. Can you, therefore, propose one member? If your friend or neighbour owns a cow he should be a member of the British Dairy Farmers' Association. Full particulars of the Association's activities and membership forms can be obtained at Stand No. 110 in the Main Hall at the Dairy Show, or at the Offices of the Association.

The entries for the Jubilee Dairy Show now in progress are considered highly satisfactory and all available space in the non-competitive section was applied for prior to the end of May. A comparative statement giving the entries for the past twelve years forms part of this report. The small entry of New and Improved Inventions is, doubtless, due to the fact that entries for this section closed on May 31st, instead, as formerly, the first week in September, and also because the Council had ruled that all Inventions should have been put to practical use and that an opportunity be accorded the judges for inspecting all entries under working conditions prior to the Dairy Show.

Members will be delighted to learn that the Lord Mayor and Lady Mayoress have graciously accepted the Council's invitation to visit the Dairy Show during the afternoon of Wednesday.

The Corporation of the City of London has again generously granted 30 guineas towards the prizes, and this sum has been expended upon the purchase of three cups which are offered in the Cheese and Butter Sections.

In order that the Association may have at its disposal a comparative statement regarding representative cattle, your Council has decided to keep an annual record to consist of photographs, weights, measurements and milk yields of animals awarded 1st prize on inspection, and/or in the Milking Trials in each Class of matured cows at the Dairy Show. It has been decided to initiate the scheme at this year's Show.

Your Council avails itself of the present opportunity of announcing that it has been decided to hold the Annual Conference for 1929 in Cheshire and North Wales. While the exact dates have not yet been fixed it is proposed to hold the Conference between May 23rd and June 20th. Every endeavour will be made to provide an attractive and instructive programme, and it is hoped that many members will take part in the proceedings.

The Inter-County Clean Milk Competition has created very keen interest, and this year eleven counties have entered. The result of the competition will be made known during the Dairy Show.

The World's Dairy Congress is now a thing of the past, but the British Dairy Farmers' Association can congratulate itself on having been responsible for the Congress being held. The total number of delegates, official and otherwise, was 1,965, and these came from 53 countries. This is a record. The largest delegation came from the United States. Many papers of a most interesting and useful nature were read and several visits of extreme educational value were made to farms and dairies, whilst those who were fortunate enough to visit the National Institute for Research in Dairying at Reading were loud in its praise. On all sides were heard complimentary statements with regard to the hospitality which was so freely offered to the delegates. The British Dairy Farmers' Association, besides being the parent body of the Congress, invited all the official delegates to a banquet, over which Lord Desborough, K.G., G.C.V.O., presided, and this, together with the hospitality extended by H.M. The King, the Government, the Corporation of the City of London, Mr. and Mrs. Titus Barham, and the Congress Committee's entertainment at the Crystal Palace, represented the chief items of hospitality in a crowded week spent in the Metropolis.

A conference has been held between representatives of the National Agricultural Examination Board and the British Dairy Farmers' Association as to the possibility of combining the National Diploma in Dairying and the British Dairy Farmers' Association Dairy Diploma. It was felt that as these two examinations were held on the same syllabus much unnecessary strain was placed upon both teacher and student.

An agreement has been reached for an amalgamation and details now being discussed will be more fully given in a later report. The combined examination will be held in accordance with the 1928 Syllabus.

Upon the death of Lord Kenyon, K.C.V.O., Lord Desborough, K.G., G.C.V.O., who very kindly consented to act as President of the Association, retires at the close of this year. The Council is extremely grateful to his Lordship for the kindly interest he has taken in the Association and sincerely trust that he will be long identified with its activities.

Your Council has been honoured by Lord Daresbury, C.V.O., whose interest in the industry is so well-known, in allowing his name to be submitted as President elect for 1929, and your vote will be asked in support of his candidature.

The following list of Vice-Presidents has been prepared and your approval will be asked for their re-election :—

The Marquis of Crewe, K.G., P.C., D.C.L.

Earl of Dartmouth, P.C., K.C.B.

Earl of Iveagh, C.B., C.M.G.

Lord Desborough, K.G., G.C.V.O.

Lord Strachie.

Major Lord O'Hagan.

Lord Bledisloe, P.C., K.B.E.

S. Palgrave Page, J.P.

G. Titus Barham.

S. R. Whitley, J.P.

Major J. A. Morrison, D.S.O.

In accordance with the Articles of Association the following members of the Council retire this year, and with the exception of Viscount Lewisham who does not seek re-election, have been again nominated :—

W. S. Brocklehurst, Bedfordshire.

William Burkitt, Durham.

Jesse Crumpler, Somerset.

Mrs. Jervoise, Hampshire.

Viscount Lewisham, Kent.

Capt. R. Oliver-Bellasis, Warwickshire.

Mrs. M. Reeves, Somerset.

Robert Shanks, Sussex.

Miss J. Stubbs, Lancashire.

E. P. F. Sutton, Berkshire.

E. G. F. Walker, Somerset.

Dr. R. Stenhouse Williams, Berkshire.

The following new candidates have been duly proposed and seconded :—

F. W. Gilbert (Farmer), Chellaston, near Derby. Proposed by
J. Bromet, seconded by W. Twentyman.

H. P. Mortimer, J.P. (Farmer), Kingsley Windmill, Cheshire.
Proposed by T. Peacock, seconded by T. C. Goodwin.

Wm. Rice (retired Poultry Farmer), 3, Ludgate Broadway,
London, E.C. 4. Proposed by C. N. Goode, seconded by
C. E. Brooke.

G. C. Sankey (Farmer), Down Lodge, Fairlight, Hastings. Pro-
posed by Dr. T. J. Drakeley, seconded by E. W. S. Press.

G. M. Strutt (Dairy Farmer), New House, Terling, Chelmsford.
Proposed by W. Wallace, seconded by R. Wallace.

Mr. Herbert J. Page, of Messrs. Kemp, Chatteris, Nichols,
Sendell & Co., will be proposed as the Association's official Auditor,
with Messrs. P. Hay, H. E. Hughes and W. E. Manchester, J.P., as
Hon. Auditors.

By order of the Council,

FRED J. BULL,

Secretary.

28, RUSSELL SQUARE,

LONDON, W.C. 1.

October, 1928.

THE FOLLOWING TABLE GIVES COMPARATIVE DETAILS OF THE ENTRIES AT THE DAIRY SHOW WITH THOSE OF THE PAST TWELVE YEARS.

	1913.	1914.	1915.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.
Cattle	286	234	204	292	384	455	515	539	473	470	449	449	366
Milking and Butter Tests ...	265	167	198	334	492	614	760	772	718	700	693	737	563
Goats,	110	85	116	115	109	101	91	67	72	48	78	68	53
Poultry	3,840	3,089	2,653	2,736	4,317	4,348	4,398	4,685	4,498	4,355	4,352	3,888	3,642
Pigeons	2,467	2,291	2,735	2,760	3,259	3,272	3,208	3,115	3,027	3,094	3,180	3,098	3,083
Cheese	395	301	271	342	462	406	418	488	486	459	489	688	664
Bacon and Hams	89	67	45	—	34	56	87	89	113	95	94	105	103
Butter	549	371	339	242	286	322	388	401	483	420	430	488	476
Cream	43	27	20	16	19	32	37	33	30	47	30	43	47
Skim-milk Bread, &c.	64	46	65	40	40	No class	No class	No class	No class	No class	No class	No class	No class
Honey, &c.	106	126	77	20	49	63	58	92	102	53	65	56	88
Bottled Fruits and Vegetables	—	—	—	—	45	25	26	53	65	33	56	80	34
New and Improved Inventions,	41	24	6	23	14	38	30	37	37	54	50	57	13
Roots	190	59	51	80	144	148	183	190	283	269	271	242	165
Buttermaking Contests	141	97	101	110	86	162	141	129	154	130	131	155	124
Milkers' Contests	137	85	82	77	80	98	44	43	56	51	47	61	44
Junket-making Contest	—	—	—	—	7	8	12	23	33	27	28	38	36
Collection of Colonial Produce	—	—	—	—	2	2	3	3	1	2	2	—	—
Cow-Judging Contest	—	—	—	—	—	—	—	7	4	8	10	9	7
Collection of Produce	—	—	—	—	—	—	—	—	8	18	9	9	7
	8,723	7,069	6,963	7,187	9,829	10,150	10,399	10,766	10,643	10,333	10,464	10,271	9,515

FIFTY-THIRD ANNUAL REPORT OF THE COUNCIL

Year ended 31st December, 1928,

TO BE PRESENTED TO THE GENERAL MEETING OF MEMBERS.

THE year 1928 was one of very great interest to all engaged in the dairying industry, inasmuch as the World's Dairy Congress made its initial visit to this country. It was a matter of supreme satisfaction to the Council, which had taken such pains to assist in the inauguration of so colossal an undertaking, to observe the enthusiastic spirit with which all sections of the industry welcomed the Congress.

The Association was first in the field with a promise of £500 towards the project, and at one time it was gratifying to think that so successful had been the venture that a call for the whole of that amount would not be made. However, final figures reveal a deficiency, and the £500 has now been paid.

Of the beneficial results from the Congress it is yet too early to speak, but it is inconceivable to think that such an assembly should have fraternised so long without great benefit to its members and in turn to the industry they represented. The Council trusts that one benefit will be a considerable increase in the members of this Association which was so largely responsible for the initiation of the Congress.

Whilst 149 new members have been enrolled during the past year, 119 names have unfortunately been removed from the register owing to deaths, resignations, and non-payment of subscriptions. The total membership of 1928 is, therefore, only 30 above the previous year's figure of 1,798. The Council would like to receive additional support during the current year whereby the usefulness of the Association may be materially advanced, and desires to solicit the members co-operation in this direction by enlisting the sympathy of those engaged in the industry.

The financial aspect as shown by the accompanying report of the auditors and statement of accounts is, taken as a whole, satisfactory, but the Council must again stress the point that it is only by the continued success of the Dairy Show that so pleasing a balance sheet is possible. It is vital to the financial safety of the British Dairy Farmers' Association that its general income shall approximate closer to its general expenditure which by every effort is reduced to a minimum consistent with efficiency.

During the year the Council has granted 100 guineas to the Royal Veterinary College for research work on Mammitis; £50 to the National Milk Publicity Council, and 10 guineas to the Royal Agricultural Benevolent Institution.

The Council records with great satisfaction the continued popularity and success of the annual Dairy Show. The various departments are reported upon in the Journal, Vol. 41, and it is, therefore, only necessary to here mention that although there was a decrease in the entries, the year's balance sheet was satisfactory.

In addition to the usual examinations held at the British Dairy Institute, Reading; Studley College, Warwickshire; East Anglian Institute of Agriculture, Chelmsford; and Cannington Court Farm Institute, Bridgwater, candidates were examined at Seale-Hayne Agricultural College, Newton Abbot, and the Agricultural Institution, Usk, Monmouth. As a result of these examinations 24 Diplomas, 79 Buttermaking, and 44 Cheesemaking Certificates have been awarded.

The dates for the Diploma examination for 1929 have been fixed as under:—

September 5th, 6th and 7th—Papers at Reading and Kilmarnock.

September 9th to 12th—Practical and *Viva Voce* at Reading.

September 18th to 21st—Practical and *Viva Voce* at Kilmarnock.

An agreement having been reached for the amalgamation of the National Dairy Diploma and the British Dairy Farmers' Diploma this examination is now held under a new authority—the National Dairying Examination Board which consists of six members from each of the following:—

Highland and Agricultural Society of Scotland.

Royal Agricultural Society of England.

British Dairy Farmers' Association.

Under the Medal Distribution Scheme, the following Medals were awarded during 1928 :—

	Gold.	Silver.	Bronze.
Dairy Cattle	—	9	5
Produce	—	3	6
Buttermaking	—	4	2
Clean Milk Competitions ...	12	2	—
Dairy Herds Competitions ...	—	1	1
Milkers' Contests	—	2	2
Cow-judging Contests	—	2	4
	—	—	—
Totals	12	23	20
	==	==	==

Clean Milk Competitions have been held in most counties in England and Wales during the past four years, and the total number of milk producers competing has shown steady annual increase. Several interested bodies and private persons have helped in furthering the aims of the competitions by providing trophies of various descriptions to be awarded to the leading competitors. Prominent among these donors have been the National Milk Publicity Council and the British Dairy Farmers' Association, both of which have freely offered gold, silver and bronze medals. Hitherto there has been no co-operation between these two organisations in respect of these awards, with the result that in some cases both were giving medals in one and the same competition. Now, however, as the result of a conference between the National Milk Publicity Council, the British Dairy Farmers' Association and the Ministry of Agriculture and Fisheries, a definite scheme of awards has been mutually evolved and approved whereby the National Milk Publicity Council agree to offer medals to be won in approved County Competitions, and the British Dairy Farmers' Association will provide super awards in the form of a gold medal, to the leading competitor in each of the Advisory Provinces as arranged by the Ministry of Agriculture. While the scheme applies to Clean Milk Competitions, held during 1928 and subsequent years, it does not interfere with awards by the British Dairy Farmers' Association in connection with the annual Inter-County Clean Milk Competition.

The Council avails itself of the present opportunity of announcing that it has been decided to hold the Annual Conference for 1929 in Cheshire and North Wales from May 27th to 31st, inclusive. Every endeavour will be made to provide an attractive and instructive programme, and it is hoped that many members will take part in the proceedings.

At the 53rd half-yearly meeting of members, held on October 24th, 1928, among the several suggestions made the Council was asked to ascertain what could be done to find out the real food value of milk which had not received any treatment, as the result might prove to be so overwhelmingly in favour of milk as milk. After consideration it was agreed that the Association might, in collaboration with other bodies, send a deputation to the Medical Research Council to stress the necessity for work in this field of research, and a sub-committee was formed to thoroughly consider the matter. The same sub-committee will consider what further steps can be taken to encourage the production of clean milk.

Also at this meeting the Council was strongly urged to take such steps as would encourage owners to send cows from graded herds to compete at the Dairy Show. A sub-committee has been appointed to consider this matter.

During the year 1928 the following resolutions have been passed and forwarded to the bodies concerned :—

4th April.

CREAM (PROHIBITION OF PRESERVATIVE) ORDER.

"This Council, having been made aware that attempts are being made to secure the cancellation or modification of the Order and being of opinion that its maintenance is in the best interests of the British dairy farmer, respectfully urges His Majesty's Government to maintain the Order in its present form until it has been in operation for at least a full year.

"The Council further urges the Government to take immediate steps to enforce the declaration of reconstituted cream as such at all stages in its sale as distinguished from natural cream."

11th December.

"That where an outbreak of Foot and Mouth Disease is confirmed after animals have left their district for a Show, or during the period of the Show, any animals from the district which may be declared to be a Foot and Mouth Disease infected area, and which may be in the Show at that time, should immediately upon notification of the outbreak be removed from the Showyard and returned to their owners premises, so that as soon as they return the infected area could be sealed and movement prohibited. This would save the Society the expense of having to erect special isolation premises and to keep and feed the animals during the detention period."

The above Resolution was also sent forward by the Royal Agricultural Society of England.

By Order of the Council,

FRED J. BULL,

Secretary.

The British Dairy

FINANCIAL

Dr.

GENERAL INCOME AND EXPENDITURE

WITH COMPARATIVE

EXPENDITURE.			1928.			1927.		
	£	s. d.	£	s. d.		£	s. d.	
Education and Examinations—								
Reading	189	15 2				188	9 2	
Chelmsford	12	19 0				15	17 6	
Studley	13	15 6				16	13 1	
Somerset	11	14 2				12	11 8	
Monmouth	15	13 4				—		
Newton Abbot	10	13 9				—		
			254	10 11				
Journal			487	11 10		587	8 8	
Medal Scheme			90	16 1		102	7 8	
Bank Charges			18	8 9		17	15 6	
Rent			240	0 0		240	0 0	
Prizes to Exhibitors			3,440	11 0		2,365	16 10	
Sales of Exhibits			1,114	10 6		1,205	1 9	
Dairy Show—Hire of Hall, Fittings, Postage and								
Sundry Expenses			5,474	17 7		5,829	15 5	
Working Dairy			557	4 10		529	7 11	
Catalogues			1,123	15 9		1,118	17 4	
Salaries			958	10 0		861	3 4	
Wages and Labour			1,520	17 11		1,403	2 3	
Printing, Stationery, Postage, and Sundry Office								
Expenses			319	6 1		331	7 0	
Banquet, World's Dairy Congress			217	17 0		—		
Re-decorating Offices			—			59	8 0	
Railway Fares for Attendance at Council Meetings			219	1 0		212	8 4	
Auditors' Fees, Law Charges, and Officers'								
Retaining Fees			143	7 0		148	1 0	
Depreciation of Furniture and British Dairy In-								
stitute Plant			100	14 3		73	8 7	
Donations—								
£ s. d.								
Royal Veterinary College	105	0 0				200	0 0	
National Milk Publicity Council	50	0 0				—		
British Dairy Institute	50	0 0				—		
Royal Agricultural Benevolent								
Institution	10	10 0				10	10 0	
Central Chamber of Agriculture	5	0 0				5	0 0	
National Pigeon Association	1	1 0				1	1 0	
Joint Committee of British								
Live Stock Breeders	1	1 0				—		
			222	12 0				
Corporation Duty			—			37	17 6	
Stands at Agricultural Shows			170	19 8		40	0 0	
Entry Fees returned on account of Foot and Mouth								
Disease			16	10 0		1,211	15 0	
Conference Account			—			53	8 2	
Inter-County Clean Milk Competition			150	2 0		116	10 0	
General Analyses			33	6 9		8	8 0	
BALANCE, being excess of Income over Expenditure			2,259	13 6		1,806	10 3	
			£19,135	4 5		£18,810	0 11	

Farmers' Association.**STATEMENTS.****ACCOUNT for the Year ended December 31st, 1928.****Cr.****STATEMENT FOR 1927.**

INCOME.					1928.	1927.
					£ s. d.	£ s. d.
Subscriptions	...	...	...	...	1,585 6 6	1,564 18 6
Examinations—				£ s. d.		
Reading	...	...	...	66 1 7		53 18 7
Chelmsford	...	...	...	12 19 0		15 17 6
Studley	...	...	...	13 15 6		16 13 1
Somerset	...	...	...	11 14 2		12 11 8
Monmouth	...	...	...	15 13 4		—
Newton Abbot	...	...	...	10 13 9		—
					180 17 4	
Journal	...	...	...	...	182 14 11	122 15 6
Contributions to Prize Fund	...	...	...	...	323 11 6	67 12 6
Entry Fees, Competitive and Non-Competitive	...	...	...	...	9,271 0 0	9,962 12 2
Sales of Exhibits	...	...	...	...	1,174 10 2	1,340 9 0
Admission Money	...	...	...	...	3,976 11 6	3,561 10 6
Sales in Working Dairy	...	...	...	...	535 6 11	456 8 4
Catalogue Sales and Advertisements	...	...	...	...	1,196 0 3	935 1 8
Interest on Investments—						
Taxed before receipt	...	...	603 4 0			555 4 0
Untaxed before receipt	...	...	100 0 0			100 0 0
Bank Deposit	...	...	45 1 10			35 9 5
					748 5 10	
Hire of Council Room	...	...	...	...	10 19 6	8 18 6
					£19,135 4 5	£18,810 0 11

STATEMENT OF ASSETS AND

[illegible]

REPORT OF THE AUDITORS TO THE MEMBERS OF THE BRITISH DAIRY FARMERS' ASSOCIATION.

We have audited the foregoing Statement of Assets and Liabilities and the Income and Expenditure Account with the books and accounts of the Association. We have received all the information and explanations we have required. In our opinion such Statement of Assets and Liabilities is a full and fair statement containing the particulars required by the Regulations of the Association, and properly drawn up so as to exhibit a true and correct view of the state of the Association's affairs according to the information and explanations we have received and as shown by the Books.

(Signed) HERBERT J. PAGE, *Chartered Accountant*

(Signed) HERBERT J. PAGE, *Chartered Accountant*,
36, Walbrook, } *Auditors.*
H. E. HUGHES, }
London, E.C. 4 }

14th February, 1929.

British Dairy Farmers' Association.

MEDAL SCHEME.

Special Prizes at Educational Institutions and Agricultural Shows, &c.

THE Council of the British Dairy Farmers' Association is prepared to consider applications from Educational Centres and Approved Societies in the United Kingdom for their Gold, Silver, and Bronze Medals to be awarded in connection with dairying and dairy farming under the following conditions, viz. :—

1. All applications must be made on our official form and must clearly state the object for which the Medal or Medals are required.
2. Only one application from any Institution or Society can be considered in any one year.
3. The application must be repeated annually if Medals are again required.
4. A copy of the Proposed Prize List, showing the Conditions of the Award of the Medal and the name of the judge, should accompany the application, and the offer of a Medal cannot be confirmed until the Prize List has been approved.
5. The British Dairy Farmers' Association stipulates that no entry fee shall be charged in respect of these Medals, they being offered as Special Extra Prizes.
6. Notification of the award, with the winner's full name and address, to be forwarded to the Secretary, British Dairy Farmers' Association, 28, Russell Square, London, W.C.1, within 14 days of the award being made.
7. A person may not receive more than one Medal under this Scheme for the same subject or exhibit during any one year.

STUDENTS.—The B.D.F.A. Silver Medal for Students is reserved for those who have obtained the B.D.F.A. Diploma.

The B.D.F.A. Bronze Medals may be awarded on application to Students gaining the first position in short course Examinations and the prospectus of the course must be forwarded with the application for the Medal.

DAIRY PRODUCE AND BUTTERMILK.—The B.D.F.A. will consider applications on behalf of County or similar Shows for a Silver Medal as a Championship award.

The B.D.F.A. Bronze Medals or Certificates may be available for local Shows, and in each case shall only be awarded to the best exhibit or competitor.

CATTLE.—The B.D.F.A. Silver Medals will only be awarded at County and similar Shows to cows or heifers milk recorded under the Ministry of Agriculture Scheme.

The B.D.F.A. Silver Medals will only be awarded to Bulls out of recorded cows.

The B.D.F.A. Bronze Medals for cattle will be available only at Local Shows under similar conditions.

CLEAN MILK COMPETITIONS.—The B.D.F.A. Gold Medal may be available, on application, to the winner of clean milk competitions of six months or more duration. Silver Medals for clean milk competitions of shorter duration.

In the event of any dispute as to the interpretation of these Rules, the Council of the British Dairy Farmers' Association reserves full power of decision, and in the event of the Medal not being awarded in accordance with the above Rules and Conditions, the Council reserves the right to withhold the Medal altogether.

AWARDS DURING 1928.—Continued.

Applicant.	Show or Examination held at	Date.	Medal.	Winner and object.
North-east Somerset Farmers' Club	Pensford	Aug. 6	Bronze	C. Gay & Son. Best exhibit of Cheese.
Bredon & District "Agricultural Society"	Twickenham	"	Bronze	W. H. G. Edwards. Best exhibit of Butter.
Tring Agricultural Society	Tring	Aug. 9	Silver	J. G. W. Tilt. Shorthorn Cow, "Newington Dandy," as best Milk Recorded Dairy Cow or Heifer.
Harrogate Agricultural Society	Harrogate	Aug. 10	Bronze	J. R. Upson. British Friesian Heifer, "Sawcen's Grizzle 10th," as best Milk Recorded Dairy Cow or Heifer.
Penrith Agricultural Society	Penrith	Aug. 14	Bronze	Miss Hodgson. Best exhibit of Butter.
Glanum Irish Agricultural Society	Pedwell	Aug. 17	Bronze	J. Smith. Shorthorn Cow, "Minnie," as best Milk Recorded Dairy Cow.
" " "	"	"	Bronze	A. G. Joynton. Welsh Black Bull, "Cwm Caradoc," as best Dairy Bull out of a Milk Recorded Cow.
Penistone Agricultural Society	Penistone	Aug. 23	Bronze	R. J. George. Welsh Black Cow, "Glan Queen," as best Milk Recorded Dairy Cow or Heifer.
East Devon Milk Recording Society	East Devon	Oct. 1, 1927	Silver	Miss J. R. Milken. Best exhibit of Butter.
Kent	Kent	Sept. 30, 1928	Gold	Lord Polnam. Guernsey Cow, "Ball of Ice Pats," as Milk Recorded Cow giving highest yield of butter fat.
Kent Education Committee	"	Sept. 8, 1927	Gold	Viscountess Levisham. Winner of Clean Milk Competition.
Young Farmers' Clubs	Dairy Shaw, Islington	Oct. 8, 1928	Silver	Miss D. Dowling. Highest score in Cow-Judging Contest.
" " "	"	Oct. 25	Bronze	A. W. Culley. Second highest score in Cow-Judging Contest.
" " "	"	"	Bronze	J. Jones. Third highest score in Cow-Judging Contest.
Lancashire Cheese and Dairy Show Association	Preston	Oct. 30	Silver	Ridley Hall Dairy. Best exhibit of Cheese.
Somerset and North Dorset Milk Recording Association	Somerset and North Dorset	Nov.	Silver	Capt. P. D. A. Courtenay. First place in Dairy Herds Competition.
Gloucestershire Root, Fruit and Grain Society	Gloucester	Nov. 9	Bronze	Mrs. P. C. Tury. Second place in Dairy Herds Competition.
Oxfordshire Agricultural Committee	Oxfordshire	Dec.	Silver	Mrs. W. J. Brooke. Best exhibit of Butter.
" " "	"	"	Silver	Miss E. A. Carlton. First place in Milkers' Contest for Competitors under 18 years.
" " "	"	"	Silver	Miss G. M. Horsham. First place in Milkers' Contest for Competitors over 18 years.
" " "	"	"	Bronze	Miss M. Miller. Second place in Milkers' Contest for Competitors under 18 years.
" " "	"	"	Bronze	Miss E. Carlton. Second place in Milkers' Contest for Competitors over 18 years.
Buckinghamshire County Council	Buckinghamshire	Jan. 1 to Dec. 15	Gold	E. Clifton Brown. Winner of Clean Milk Competition.

GOLD MEDALS AWARDED FOR PROVINCIAL CLEAN MILK COMPETITIONS.

Winner.	County.	Provincial Centre.	Provinces.
Viscountess Lewisham ...	Kent ...	Wye College ...	Kent, Surrey, and Sussex (East and West).
T. J. Jones ...	Cardigan ...	University College of Wales ...	Brecon, Radnor, Cardigan, Carmarthen, Merioneth, Monmouth, Montgomery, Pembroke and Glamorgan.
F. Hawes ...	Warwickshire ...	Harper Adams College ...	Salop, Stafford and Warwickshire.
R. J. Dunstan ...	Cornwall ...	Seale-Hayne College ...	Cornwall and Devon.
T. O. Shield ...	Northumberland ...	Armstrong College ...	Cumberland, Westmorland, Durham, and Northumberland.
Lord Rayleigh ...	Essex ...	Cambridge University ...	Bedford, Cambridge, Essex, Hertfordshire, Huntingdon, Isle of Ely, Lincolnshire (Holland and Kesteven), Norfolk, Stoke of Peterborough, Suffolk (East and West).
E. G. W. Wilson ...	Berkshire ...	Reading University ...	Berkshire, Buckinghamshire, Dorset, Hampshire, Isle of Wight, Middlesex, Northants, and Oxford.

British Dairy Farmers' Association.

PRIZE ESSAY
ON A
DAIRYING SUBJECT.

The Council offers a Prize of £10 and the B. D. F. A. Silver Medal for an Essay upon any practical or scientific subject relating to Dairy Farming or Dairying, conditionally upon sufficient merit being shown.

Preference will be given to one based on the original work and experience of the writer. Where the work of others is relied upon, full references must be given, either in footnotes or by numbers (1), (2), &c., with a list of authorities at the end.

The Essay should not exceed 5,000 words, and must be received by the undersigned on 1st December, 1929.

An Essay must be sent in a sealed envelope, bearing a *nom de plume*, and in another sealed small envelope, also bearing the *nom de plume*, the Author must insert his name and address.

The Prize Essay will be the property of the Association. Others will be returned to their respective Authors, but the Association reserves the right to retain Essays on subjects suitable for inclusion in the Annual Journal, which will be paid for at the usual rate for literary contributions.

FRED J. BULL,

Secretary,

28, Russell Square, London, W.C. 1.

British Dairy Farmers' Association

Suggestions to Farmers as to how best to ensure

THE

CLEANLINESS OF THE MILK SUPPLY.

The attainment of a clean milk supply is largely dependent upon the action of Dairy Farmers themselves.

Every Dairy Farmer is financially interested in this question. Public doubt of the cleanliness of the milk supply means reduced demand for fresh milk. Public confidence means increased use of milk as food and drink—consequently a larger demand.

Any Dairy Farmer by want of reasonable care can jeopardise the reputation of the whole industry and thus destroy the good work of those whose efforts are to increase the consumption of milk.

The co-operation of every producer is confidently requested.

The main points to be emphasised are :—

- (1) That consumers are entitled to receive milk which is clean and wholesome.
- (2) That the precautions necessary to produce clean wholesome milk are easy, simple and inexpensive.

Briefly these precautions are :—

To keep the milk sheds and cows as clean as possible.

To clean the udders and, before milking, wipe them with a clean damp cloth, rinsed after every cow.

To use a partly covered milking pail.

To see that milkers milk with clean hands.

To strain the milk through a strainer fitted with a new disc of cotton wool at each milking.

To empty water from cooler before washing.

To rinse utensils in cold water. Thoroughly wash in hot water and soda and scald in boiling water or, preferably, sterilise with steam or by boiling in water.

To stand utensils upside down to drain after cleaning and NOT to wipe them.

THIS ASSOCIATION APPEALS TO EVERY DAIRY FARMER TO PUT THESE PRECAUTIONS INTO OPERATION, BEING CONVINCED THAT IF PRODUCERS DO NOT TAKE MEANS TO ENSURE A CLEAN WHOLESOME MILK SUPPLY THE DEMAND FOR FRESH MILK WILL SERIOUSLY DIMINISH.

Correspondence on this subject will receive attention at the Offices of the Association, 28, Russell Square, London, W.C. 1.

National Dairy Examination Board

APPOINTED BY

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND,
THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND
THE BRITISH DAIRY FARMERS' ASSOCIATION.

Regulations and Syllabus for the National Diploma in the Science and Practice of Dairying.

1. The Societies may hold annually in England and in Scotland, under the management of the National Dairy Examination Board appointed by them, one or more examinations for the National Diploma in the Science and Practice of Dairying; the Diploma to be distinguished shortly by the letters "N.D.D."

2. The Examinations will be held on dates and at places from time to time appointed and duly announced.

3. A Non-returnable Fee of *Three Guineas* will be required from each candidate.

4. Forms of Entry for the Examination in England may be obtained from "The Secretary, Royal Agricultural Society of England, 16, Bedford Square, London, W.C.1," and must be returned to him, duly filled up, with the entry fee of £3 3s. 0d., on or before Saturday, July 20th, 1929.

5. Forms of Entry for the Examination in Scotland may be obtained from "The Secretary, Highland and Agricultural Society of Scotland, 3, George IV Bridge, Edinburgh," and must be returned to him, duly filled up, with the entry fee of £3 3s. 0d., on or before Saturday, August 3rd, 1929.

6. Any candidate may enter for the Examination either in England or Scotland, but not in both, and a candidate who has once taken part in an Examination in England cannot enter for an Examination in Scotland, or *vice versa*.

7. As a preliminary to the acceptance of an application for permission to enter for the Examination, a candidate must produce :—

- (1) A certificate testifying that he or she has attended a Diploma Course in the subjects of the Examination covering *two academic years* at an approved Dairy Training Institution, and has satisfied the authorities of the Institution of his or her fitness for admission to the Examination. This period shall include six session months' instruction (consisting of not more than two periods) in practical dairy work.
- (2) Evidence that he or she has spent at least six months on an approved Dairy Farm and taken part in the work. This period must not run concurrently with the six months' practical training referred to in sub-section 1.

(An "approved Dairy Farm" is one on which not fewer than 15 cows are kept in daily milking.)

8. A candidate who has already taken a Degree in Agriculture of a British University or a Diploma in Agriculture, recognised by the National Dairy Examination Board, will be allowed to enter for the National Diploma in Dairying Examination after one year's training at a recognised institution, providing that such course includes at least six months' training in practical dairy work, and that he or she has worked for at least six months on an approved Dairy Farm.

9. In the Examination a candidate will be required to satisfy the Examiners by means of written papers, practical work, and *visà voce*, that he or she has :—

- (1) A general knowledge of the Management of a Dairy Farm, including the rearing and feeding of Dairy Stock, the candidate being required to satisfy the Examiners that he or she has had a thorough training and practical experience in all the details of Dairy work as pursued on a farm.
- (2) A thorough acquaintance, both practical and scientific, with everything connected with the management of a Dairy, and the manufacture of Butter and Cheese.
- (3) A general knowledge of Dairy Factory Management, Dairy Hygiene, Dairy Engineering and Dairy Book-keeping.
- (4) Practical skill in Dairying, to be tested by the making of Butter and Cheese.

NOTE.—A candidate must be prepared to make any one of the following varieties of Hard-pressed Cheese, the Examiner in Cheesemaking having the option of saying during the Examination what variety a candidate shall make :—

At the English Centre :—Cheddar, Cheshire or Derby.

At the Scottish Centre :—Cheddar, Dunlop or Cheshire.

10. The maximum marks obtainable and the marks required for a pass in each subject are as follows :—

WRITTEN EXAMINATION—					Max.	Pass.
Dairy Farming	...	...	...	...	150	90
Dairy Hygiene	...	...	...	...	100	60
Dairying—						
(a) Principles of Dairying	...	...	...	...	150	90
(b) Dairy Factory Management and Dairy Engineering	...	...	...	...	100	50
Chemistry	...	...	...	...	100	60
(a) General Physics and Chemistry ;						
(b) Dairy Chemistry.						
Dairy Bacteriology	...	...	...	...	100	60
Dairy Book-keeping	...	...	...	...	100	50
PRACTICAL EXAMINATION—						
Hard-pressed Cheesemaking	...	...	...	...	200	150
Blue-veined Cheesemaking	...	...	...	...	100	75
Soft Cheesemaking	...	...	...	...	100	75
Buttermaking	...	...	...	...	200	150
					1,400	910

Honours will be awarded to candidates obtaining an aggregate of 80 per cent. (1,120) of the maximum marks (1,400) in the Examination, provided that they also obtain at least 80 per cent. (400) of the maximum marks (500) in the Dairy Farming, Hygiene, and Dairying papers.

11. The Board reserve the right to postpone, to abandon, or in any way or at any time to modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

DATES OF EXAMINATIONS.

ENGLAND.—THURSDAY, SEPTEMBER 5TH, and following days, at the University and British Dairy Institute, Reading. Last date for receiving applications, SATURDAY, JULY 20TH.

SCOTLAND.—At Dairy School, Kilmarnock. WRITTEN—THURSDAY, FRIDAY AND SATURDAY, SEPTEMBER 5TH, 6TH & 7TH. ORAL AND PRACTICAL—MONDAY, SEPTEMBER 16TH, and following days. Last date for receiving applications, SATURDAY, AUGUST 3RD.

SYLLABUS OF SUBJECTS OF EXAMINATION.

1.—DAIRY FARMING AND DAIRY HYGIENE.

(a) Dairy Farming.

Soils and Crops.—Types of soils suitable for dairying. Rotations and systems of cropping. Cultivation, manuring and management of grain, root and forage crops used in dairying. Silage. Temporary and permanent pastures, haymaking.

Plant Physiology.—Roots, shoots, flowers, fruit and seeds of agricultural plants.

Dairy Cattle.—Characteristics of different breeds. Relation of conformation and appearance to milk yield. Choice of dairy cattle in relation to climate and soil. The milk yields of the more important breeds, and suitability for the milk trade, cream, butter and cheese production.

The management of a dairy herd. Cattle breeding and grading-up of dairy stock. Calf rearing and management of young stock.

Milk Recording. Systems, and utilization of results. Details of official schemes.

Foods and Feeding.—Summer and winter feeding of dairy cattle and young stock. Fodder crops and green forage. Roots. Ensilage. Concentrated foods, meals, cakes. Preparation of food. The effect of food on milk and its products.

Pig Keeping.—Characteristics of the more important breeds. The breeding, rearing and fattening of pigs. Production of pork and bacon.

Farm Management.—Systems of dairy farming. The selection, stocking and equipment of typical farms. Organisation of the farm and disposal of produce.

Dairy Economics.—The dairy industry of Great Britain and its relationship to agriculture. The relative importance of the various products. The retail milk trade. Markets, dairy organisation and co-operation. Modern developments in the dairy industry. Sources of imported dairy produce.

(b) Dairy Hygiene.

Animal Physiology.—General functions of the organs of the animal body. Breeding. Parturition. The structure of the udder and the process of milk secretion. Changes which food undergoes during digestion.

Veterinary.—The more important diseases of dairy cattle and their treatment. The transmission and eradication of disease.

Milk Hygiene.—Sanitary conditions. Suitability of water supply. Methods of milking and handling of milk. Regulations affecting milk production. Milk in relation to Public Health.

Farm Buildings.—Situation, chief dimensions and construction of cow houses and dairy buildings. Housing for young stock and pigs. Air space and ventilation, drainage and water supply.

2.—DAIRYING.

(a) Principles of Dairying.

Milk.—Milking by hand and machinery. Importance of cleanliness. Cooling of milk. Prevention of contamination. Pasteurisation. Sterilisation. Keeping of milk. Milk testing and sampling. Use of Gerber and Babcock Testers. Interpretation of results. Legal standards. Legislation affecting milk production.

Cream.—Separators and their management. Different systems of cream raising and ripening of cream. Changes during ripening. Natural and artificial ripening, and preparation and uses of starters. Preparation of cream for sale. Uses of preservatives. Clotted cream.

Butter.—Churns and buttermaking appliances. Preparation of cream for churning. Washing and working butter. Butter milk. Packing and transmission of butter. Selection and keeping of butter. Salting. Use of preservatives. Characteristics of good butter and method of judging. Circumstances affecting the flavour, texture, colour, and keeping qualities of butter. Potting butter for keeping. Causes of inferior butter.

Cheese.—Principles of manufacture. Appliances for cheesemaking. The making of the principal varieties of British, Colonial and Continental cheese from cream, whole milk and skim milk. Acidity of milk. Common tests for acidity. Uses of rennet and its substitutes. Whey. Ripening and storage of cheese. Packing and sale of cheese. Making of cream and other soft cheese. Defects in cheese and their causes. Judging cheese.

(b) Dairy Factory Management and Dairy Engineering.

Factory Practice.—Milk depôts and handling of factory milk. Systems of cooling and refrigeration. Pasteurisation. Factory butter and cheesemaking. Milk powders. Condensed milk. Frozen milk. Ice cream. Dried casein. Fermented milk. Lactose and whey-butter. Margarine manufacture. Equipment of milk depôts, butter, cheese and dairy factories.

Factory Management.—Factory routine. Organisation of labour. Handling of milk on arrival at the factory. Methods of dealing with the milk. Milk contracts. Dairy factory legislation.

Dairy Appliances and Machinery.—Appliances used in the production and handling of milk, butter and cheese. Care and management of engines and boilers, dairy factory machinery, refrigerating machinery.

Buildings.—Situation, construction and drainage of creameries, milk depôts and dairy factories.

3.—CHEMISTRY.

(a) General Chemistry and Physics.

Physics.—The different forms of matter; solid, liquid, gaseous. Specific gravity and instruments for determining it. Temperature and methods of measuring it. Expansion; thermometric scales. Influence of temperature in dairy operations. Atmospheric pressure and its measurement. Hygrometry. Heat and its measurement; specific heat. Latent heat. Conduction. Convection. Radiation. Solution. Filtration. Distillation. Simple machines, such as levers, pulleys and light weighing machines.

Chemistry.—Elements, compounds and mixtures. Chemical symbols, formulæ and equations. Acids, bases, salts: their distinctive properties. Acidity and alkalinity; their quantitative estimation. The atmosphere: its constituents and impurities; influence on dairying operations. Water: its constitution; pure and natural waters; impurities in water and whence derived. Importance of a good water supply in dairying. General knowledge of elementary chemistry. Oxygen: hydrogen; carbon; nitrogen; phosphorus and sulphur; common metals; common acids; compounds of potassium, sodium, ammonium, calcium.

Elementary organic chemistry; sugar, milk sugar, starch, alcohol, acetic acid, formaldehyde, butyric acid, lactic acid, glycerine, saponification of fats: albumen, casein, pepsin.

(b) Dairy Chemistry.

Chemistry of Milk.—The nature, composition, properties and chemical constituents of milk. Microscopical appearances presented by milk. The influence of feeding. The changes which occur in the keeping of milk, and how produced. The natural and artificial souring of milk. Rennet, its nature and uses.

Milk Products.—Physical and chemical changes involved in the making and keeping of butter and in the manufacture and ripening of cheese. Separated milk. Condensed milk. Fermented milk. Synthetic milk. The use of preservatives.

Dairy Analysis.—Analytical methods, their theory and practice. A general knowledge of the methods employed in the chemical analysis of milk, butter and cheese. Adulteration of milk, cream, butter and cheese, the ways in which adulteration is practised, the changes in composition thereby produced, and a general knowledge of the methods employed in detecting the same.

Chemistry of Feeding.—The principal constituents of food materials and the functions they severally fulfil. The influence of food constituents on milk production. Assimilation and digestion. The manurial value of foods. Milk and milk products as foods.

4.—DAIRY BACTERIOLOGY.

General Bacteriology.—Bacteria ; their form, classification, growth and reproduction. The microscope and its use. Staining and microscopic examination of bacteria. Methods of isolation and cultivation. Preparation of culture media. Fermentations and chemical changes produced by bacteria. Enzymes and their action. Effects of heat, cold, sterilisation, pasteurisation, disinfectants and preservatives on bacteria and enzymes. Bacteriological examination of water supplies.

Bacteriology of Milk.—The changes produced by bacteria in milk. Useful forms and their functions. Harmful forms and their effects. Coagulation, discolouration, taints, &c. Bacteriological and other standards in relation to the cleanliness of milk.

Milk Products.—The bacteria concerned in the ripening of cream and buttermaking. "Starters," their preparation and management. The ripening of hard, soft and blue-veined cheese. Bacteria injurious to milk products, including condensed and dried milk.

Dairy Mycology.—Moulds and yeasts in dairy practice. Their form, classification, growth and relation to dairy products.

5.—DAIRY BOOK-KEEPING.

General Principles.—Principles of double-entry book-keeping. Use of diary, journal, cash book and ledger. Posting to ledger. Preparation of profit and loss account and balance sheet. Systems of valuation.

Farm Book-keeping.—Application of the principles of book-keeping to dairy farming and to the sale of milk in bulk or by retail.

Factory Accounts.—Methods of book-keeping as applied to milk depôts and dairy factories.

Business Management.—General office work. Banking and use of cheques.

6.—PRACTICAL SKILL IN DAIRY WORK.

Candidates must be prepared:—(1) to produce before the Examination a satisfactory certificate of proficiency in the milking of cows, signed by a practical dairy farmer, and to satisfy the Examiners by a practical test, if so required ; (2) to churn and make into butter a measured quantity of cream ; and (3) to make one cheese of each of the following varieties:—(1) Hard-pressed, of not less than 30 lb. (see note to Reg. 9 (4).) (2) Veined or blue-moulded, of not less than 10 lb., and (3) also to make one or other of the following Soft Cheeses : Cambridge, Camembert, Coulommier, or Pont l'Évêque.

British Dairy Farmers' Association.

CERTIFICATE IN DAIRY FACTORY MANAGEMENT.

Candidates for the Certificate in Dairy Factory Management must fulfil the following conditions :—

1. They must possess an approved Diploma in Dairying.
2. They must have had six months' practical instruction at an approved dairy factory, or at an approved dairy factory school.
3. They must obtain 60 per cent. of the possible marks in the examination for the Certificate in Dairy Factory Management.

Examination for the

CERTIFICATE IN DAIRY FACTORY MANAGEMENT.

1. Two papers will be set on the subjects outlined in the following syllabus.
2. Candidates will be examined orally in Factory Management with reference to the type of factory in which their practical training has been obtained.
3. Candidates must submit to the Examiners full notes of the work which has been carried out in the factories in which their practical experience has been obtained.

SYLLABUS OF EXAMINATION.

This Syllabus should not be viewed from a purely engineering standpoint, but students will be expected to have a general knowledge of the management of factory machinery :—

Paper 1.—Planning, Equipment and Management of a Dairy Factory.

Dairy Factories.—Site, building materials, construction, laying of floors, lighting, ventilation, drainage, sanitation, disposal and treatment of sewage and factory waste. Space requirements for the common types and sizes of factories.

Water Supply.—Water requirements ; sources of supply. Examination for quality and purity. Methods of purification. Suitability of water supplies for dairy purposes. Sites for wells. Construction of wells. Artesian wells. Pumps for deep and shallow wells. Air-lift pumps.

Factory Equipment.—Artificial lighting and sources of power in the factory. Equipment required for various types of factories and approximate cost of same. The disposition and control of factory machinery.

Steam Plant.—Types of vertical and horizontal boilers and their relative advantages and disadvantages. Sizes of boilers required in dairy factories. Evaporating power of boilers. Setting and insulation. Cleaning out of boilers. Economical firing. Fuel used, *e.g.*, coal, coke and wood. Cost and calorific value. Fuel consumption and cost of steam production. Allocation of steam supply to different purposes in the factory. Boiler smoke stacks and their construction. Boiler fittings, including donkey pumps and water injectors. Feed heaters. Methods of economising steam supply.

Factory Machinery.—Steam, gas and oil engines. Electric motors, turbines, water power, comparison of the various types and their relative efficiency. Construction and working of the various types. Cost of maintenance. Power requirements of the factory and the most suitable combinations of power when different sources of energy are available. The management and fitting up of machinery, including electric fittings. Adjustment of bearings. Packing of glands. Fixing of brackets, &c. Lubrication of machinery. Oil containers and filters. Lubricants. Lubrication of high-speed machinery. Oils and grease for shafting. Arrangement of machinery and methods of transmitting power. Belts, types and uses. Repairs to belting. Pulleys and gearing. Methods of increasing and reducing speed. Labour-saving devices. Tools required for a dairy factory.

Factory Plants.—Construction and operation of milk apparatus, including clarifiers, pasteurisers, separators, milk pumps, refrigerators, &c. Refrigerating machinery, CO₂ and ammonia. Methods of operation and management. Cold storage and brine cooling. Efficiency in the transfer of heat in heating and cooling apparatus. Methods of carrying out efficiency tests under different conditions and outputs. Factory appliances including cheese vats, holding vats, power churns, bottling machinery and other factory equipment. Their approximate cost and suitability of the various types. Methods of cleaning equipment, utensils and milk churns.

Factory Management.—Organisation of labour. Business management. Book-keeping. Cost accounts. Profit and loss in manu-

facturing. Stock-taking and depreciation. Railway rates and conditions. Road transport. Systems and comparative costs. Advertising. Markets and sale of produce. Co-operative organisation.

Factory Law.—Law as far as it affects the factory, the management and the produce. Factory and Workshops Act. Workmen's Compensation. Health Insurance. Employer's Liability and Trade Boards Acts. Industrial and Provident Societies Act. Rivers Pollution Act. Sale of Foods and Drugs Act. Milk and Dairies Acts. and other legislation as it affects the working of factories and the manufacture and sale of dairy produce.

Paper 2.—Handling and Utilization of Milk and Milk Products.

Handling of Milk.—Purchase, collection and distribution of milk. Management of milk on arrival at the factory. Weighing, sampling, testing, recording and cleaning. Methods of paying for milk and cream.

Utilization of Milk.—Methods of dealing with milk for sale for cream production, buttermaking, cheesemaking, and for the manufacture of other products.

Factory Products.—Preparation of cream for market. The manufacture and treatment of butter and cheese. Manufacture of condensed and powdered milk, casein and milk sugar, &c. Ice cream manufacture, &c. The utilization of by-products.

Pig-Keeping.—Feeding and management of pigs. The production of pork and bacon. Bacon curing.

The Entry Fee for each Candidate is £4 4s.

Any further particulars and Entry Forms for this Examination may be obtained from—

THE SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.1.

Examination for
CHEESEMAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

**A Certificate of Merit for Proficiency in the Theory and Practice of
Cheesemaking.**

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Cheesemaking. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. On the same or following day a Practical Examination in Cheesemaking will take place.

Candidates will be considered to have passed the Examination if they obtain not less than 60 per cent. of the marks on each and every written paper and not less than 66 per cent. in the Practical Test.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least twelve months' instruction in the Theory and Practice of Cheesemaking, of which at least six months must have been spent at a recognised centre for dairy instruction. They must possess a sound knowledge of the subjects included in the following Syllabus.

Candidates will be required to make one Hard-pressed Cheese, either Cheddar, Cheshire or Derby, to be selected by the Examiner, and one Blue-veined Cheese, either Stilton or Wensleydale, to be selected by the Candidate. They must also have a knowledge of the manufacture of other varieties of Hard-pressed Cheese and of Soft Cheese.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Examinations for Cheesemaking Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 10s.

SYLLABUS.

1. *Milk*.—The Food Value of Milk ; The Yield of Milk from various Breeds ; Secretion of Milk and Structure of the Udder ; Milking by Hand and Machine ; Handling of Milk from Cow to Dairy ; Importance of Cleanliness ; Production of Highest Grade Milk ; Cooling of Milk ; Sale of Milk ; Influence of Food on the Yield, Flavour and Fat Contents of Milk ; Composition of Milk, Nature and Properties of its Constituents ; Differences between Morning and Evening Milk and their Causes ; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers ; Testing for Acidity ; Causes of Fermentation ; Colostrum, its Nature and Properties ; the Keeping of Dairy Records ; the Handling of Evening's Milk for Cheesemaking ; Properties of Milk suitable for Cheesemaking ; Taints in Milk, their Causes, Effects and Remedies ; Tests for such Taints ; the Ripening of Milk for Cheesemaking ; Methods and Reasons for Ripening ; use of Natural and " Culture " Starters ; Pasteurisation of Milk ; Chilled Milk ; their subsequent use for Cheesemaking ; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy ; Utilization of Dairy By-products.
2. *Cheese*.—Rennet : its Preparation, Properties, and Action upon Milk ; Testing its Strength ; Storage of Rennet ; Substitutes for Rennet ; Annatto ; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses, including the use of wood and metal tubs and jacketed vats ; Methods of Scalding ; the Development and Control of Acidity in Curd ; Salting and Brining in Cheesemaking ; Bandaging ; Ripening and Storing of Hard-pressed, Blue-veined and Soft Cheeses ; Defects in Cheese and their Causes ; Composition of Cheese ; Composition and Utilization of Whey ; the Manufacture of Whey Butter ; the Equipment of a Cheese Dairy and its Cost ; the care of Utensils ; the Detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese :—

(a) A Hard-pressed British Cheese (not less than 25 lbs. weight).

(b) A Blue-veined British Cheese (not less than 10 lbs. weight).

Any further particulars and Entry Forms for this Examination may be obtained from—

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C. 1.

Examination for
BUTTERMAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

**A Certificate of Merit for Proficiency in the Theory and Practice of
Buttermaking.**

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Buttermaking. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. On the same or following day a Practical Examination in Buttermaking will take place.

Candidates will be considered to have passed the Examination if they obtain not less than 60 per cent. on each and every written paper, and not less than 66 per cent. in the Practical Test.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least three months' instruction (not necessarily at a Dairy School) in the Theory and Practice of Buttermaking. They must possess a sound knowledge of the subjects included in the following Syllabus. They will be required to make Butter.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Examinations for Buttermaking Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 5s.

SYLLABUS.

1. *Milk*.—The Food Value of Milk; the Yield of Milk from various Breeds; Secretion of Milk and Structure of the Udder; Milking by Hand and Machine; Handling of Milk from Cow to Dairy; Importance of Cleanliness; Production of Highest Grade Milk; Cooling of Milk; Sale of Milk; Influence of Foods on the Yield, Flavour and Fat Contents of Milk; Composition of Milk, Nature and Properties of its constituents; Differences between Morning and Evening Milk and their causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its Nature and Properties; the Keeping of Dairy Records.
2. *Cream*.—The Various Methods of Obtaining Cream; the Construction and Use of the Utensils employed; Separators, the Construction and Use of the various Types; Composition of Cream, Separated Milk, Skimmed Milk, and Buttermilk, with Simple Tests for Fat in same; the Ripening of Cream—Objects and Results; Changes during Ripening; Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.
3. *Butter*.—The Various Methods of Obtaining Butter, including the Churning of Whole Milk; Utensils required, and the Preparation, Use, and Care of same; the Process of Butter Manufacture in all its details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour, and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their Causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.

Any further particulars and Entry Forms for this Examination may be obtained from—

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C. 1.

EXAMINATIONS

AT

LOCAL CENTRES.

In order to meet the convenience of Students at Dairy Schools, members of local Societies, and other persons, the Association will conduct Examinations for its Diplomas and Certificates at any place in the United Kingdom upon receiving satisfactory proof that the following conditions will be observed :—

That the School, Society, County Council, or other body requesting such an Examination to be held, undertake :—

- (1) To supply all necessary appliances and materials.
 - (2) To pay the fees and expenses of the Examiners.
 - (3) To supply the milk required free from preservatives and fit for Cheesemaking.
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Copies of Question Papers set at recent Examinations may be obtained at 3d. per copy.

Applicants are requested to state whether Diploma, Cheese, or Butter questions are required.

Further particulars and Entry Forms for Students may be obtained from—

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C. 1.

EXAMINATION RESULTS, 1928.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE SOMERSET FARM INSTITUTE, CANNINGTON; ON TUESDAY, WEDNESDAY AND THURSDAY, APRIL 3rd, 4th AND 5th.

- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Evelyn M. G. Allen, Christabel Cardell, Arthur Channings, Lily M. Field, Kathleen W. Gait, Edith M. L. Gaylard, Myra Hann, John O. C. Hewitson, Doris Z. Loxton-Hill, Muriel B. Need, Beatrice E. M. Northey, Margery Osborn and Mary E. Webb.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Arthur Channings, Doris Z. Loxton-Hill, Ida Tyley and Ivy A. Ware.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY AND TUESDAY, JUNE 11th AND 12th.

- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Harold C. Freeth, Joseph Hetherington, Edward R. Hodges, Beryl H. Huth, Joanna R. Joy, Ivy M. de M. Leathes, Florence E. Murphy, Ellen M. V. Pryce, Winifred J. Sanderson and Elizabeth M. Wheeler.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Harold C. Freeth, Joseph Hetherington and Margaret Mitchell.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE EAST ANGLIAN INSTITUTE, CHELMSFORD; ON FRIDAY, WEDNESDAY AND THURSDAY, JUNE 29th, JULY 4th AND 5th.

- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Mary E. Barker, Margaret F. Chapman, Laura L. Free, Gracenia Golding, Audrey Hiehle, Arthur S. Lee, Janet McMeekan, Lena P. Millbank, Violet Morgan, Ruth R. Sutherland and Barbara Wingfield.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Mary E. Barker, Margaret F. Chapman, Audrey Hiehle, Lena P. Millbank, Ruth R. Sutherland and Barbara Wingfield.

EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT STUDLEY COLLEGE, STUDLEY; ON MONDAY AND TUESDAY, JULY 16th AND 17th.

- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Adelheid H. M. Asser, Barbara Berens, Roma Cockburn, Elizabeth J. Cooksey, Florence G. Crosthwaite, Wilhemina M. Franklin, Norah O. Freeth, Olivia Gatheral, Mary Rogers, Osyth M. D. Spedding, Alice R. Spence and Pauline Woodhouse.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Violet F. Bosanquet, Marjory P. Lawrence, Phyllis A. Moir, Theodora Morris, Osyth M. D. Spedding, Agnes Swayne, and Elizabeth F. Turtle.

EXAMINATION FOR BUTTERMILKING CERTIFICATE AT THE SEALE-HAYNE AGRICULTURAL COLLEGE, NEWTON ABBOT; ON THURSDAY AND FRIDAY, JULY 26th AND 27th.

- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to John Burgess, Donald S. Cummins, David A. Holder, Norman D. Hunt, Herbert S. Hurrell and James E. Tredinnick.

EXAMINATION FOR BUTTERMILKING AND CHEESEMAKING CERTIFICATES AT THE AGRICULTURAL INSTITUTION, USK, MONMOUTHSHIRE; ON MONDAY AND TUESDAY, AUGUST 13th AND 14th.

- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Margaret Baker, Florence L. Coombes, Phyllis G. Haskoll, Margaret D. Morris, Joan M. Rogers, Norah Rogers, John P. Weale, and Clarice J. Williams.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Margaret Baker, Eileen V. Ellaway, Phyllis G. Haskoll, Margaret D. Morris, Joan M. Rogers, Norah Rogers, John P. Weale, and Clarice J. Williams.

EXAMINATION FOR DIPLOMA, BUTTERMILKING AND CHEESEMAKING CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER 17th, 18th, 19th AND 20th.

- A Diploma, with Honours, and Silver Medal for Proficiency in the Science and Practice of Dairying to Beth C. Beamond.
- A Diploma, with Honours, for Proficiency in the Science and Practice of Dairying to Alice P. Hassall.
- A Diploma for Proficiency in the Science and Practice of Dairying to Lilian Abbotts, Lily C. Ball, Reginald, W. Champion, George W. Channon, William E. C. Clook, Mary Curzon, Mary T. Davis, Albert I. G. Day, Cecil L. J. Everett, Marjorie Fleet, Harold C. Freeth, Margaret L. Hopson, Elizabeth E. Jones, Edith M. Lloyd, Margaret Mitchell, Phyllis M. Parrott, Una A. Ridgeway, Elinor Simon, Norah P. Slattery, Elsie Waters, George Wells and Mary Wild.
- A Certificate of Merit for Proficiency in the Theory and Practice of Buttermaking to Robert R. Allen, Winifred Brown, David R. Browning, John C. Carswell, Doris M. Clatworthy, Franz Y. Dittrick, Cecil R. Eyres, Malcolm H. Green, Eric C. Hiscock, Christian K. Hoyle, Patricia M. Nash, Earina M. Ogilvy, Mary S. Peacock, Marian Rawlings, Charlotte L. Rymer, Eric Selman, Grace I. Swatridge, Dare Warwick and Leslie E. Whitehouse.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Robert R. Allen, Winifred Brown, David R. Browning, John C. Carswell, Doris M. Clatworthy, Malcolm H. Green, Eric C. Hiscock, Christian K. Hoyle, Florence E. Murphy, Patricia M. Nash, Joseph A. O'Shea, Charlotte L. Rymer, and Angela A. Stocker.
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EXAMINATION FOR BUTTERMILKING CERTIFICATE AT
SOMERSET FARM INSTITUTE, CANNINGTON, TUESDAY,
WEDNESDAY, AND THURSDAY, APRIL 3RD, 4TH, AND 5TH,
1928.

EXAMINER :
W. J. GRANT.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. In the purchase of milk from farmers for a buttermilking factory, state the conditions which would be fair to insert regarding the price and quality of milk.
2. State as fully as you can the changes which take place during the ripening of cream.
3. Mention the green or root crops you would grow for meeting the inevitable falling off of pasture as the winter comes on.
4. What are the advantages of keeping a milk record ? The average yield in gallons you would expect from each cow ? The average fat percentage of the milk ?
5. What is the comparative percentage of loss in fat in milk skimmed mechanically, and by hand ?
6. What would you recommend as a suitable fat content in cream for churning ? The objection to cream too rich in fat ?
7. What are the principal features of a fine sample of butter ? How would you arrange a scale of points for judging it ?
8. What is the comparative value per gallon of separated milk and whey for pig feeding ?

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT
SOMERSET FARM INSTITUTE, CANNINGTON, TUESDAY,
WEDNESDAY, AND THURSDAY, APRIL 3RD, 4TH, AND 5TH,
1928.

EXAMINER :
W. J. GRANT.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Why is acidity so important in cheesemaking ?
2. What are the chief sources of taints in milk and to what causes may an abnormal loss of fat during cheesemaking be due ?
3. What is the chief difference in composition between the morning's and evening's milk ? How do you account for this difference ?
4. What is Rennet ? How is it prepared ? When dealing with a fresh dairy of milk how would you know what quantity of rennet to use to coagulate the milk sufficiently ?
5. On a dairy farm where cheese is made give the costs of the production of one gallon of milk. State how you arrive at this cost.
6. Describe briefly the process of manufacturing one variety of hard pressed cheese with which you are acquainted.
7. Describe fully the making of Coulommier and Gervaise cheese.
8. How would you proceed to judge the qualities of, say, a Wensleydale cheese ?

EXAMINATION FOR BUTTERMILKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON MONDAY
AND TUESDAY, JUNE 11TH AND 12TH, 1928.

EXAMINER :

R. H. EVANS, B.Sc.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Explain the changes which take place in milk when it is boiled.
How does boiling affect its food value ?
2. What average annual yield of milk would you expect from an ordinary herd of (a) Shorthorns; (b) Jerseys ? Assuming the milk is used for buttermaking purposes, how much butter would you expect per cow in each case ?
3. What advantage is obtained by cooling milk immediately after milking ? Is there any further advantage in first heating the milk and then cooling it ?
4. Why is the evening milk generally richer than the morning milk ?
Suggest any methods of management which would tend to obviate this difference in composition.
5. What percentage of fat would you expect to find in
 - (1) Double thick cream.
 - (2) Cream for buttermaking purposes.
 - (3) Separated milk.
 - (4) Skim milk.
 - (5) Buttermilk.
6. What is the object of ripening cream intended for butter ? Discuss the advantages or disadvantages of allowing cream to ripen on the surface of the milk.
7. Enumerate the conditions which ensure a sample of good flavoured butter.
8. Give the composition of what, in your opinion is (a) a good sample of butter; (b) an inferior sample of butter.
9. Why is a proper grain of so much importance in buttermaking ?
Having obtained a good grain, explain how it is possible to afterwards spoil it.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON MONDAY
AND TUESDAY, JUNE 11TH AND 12TH, 1928.

EXAMINER :

Miss M. M. MACQUEEN.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

(Ten only to be answered.)

1. State average composition of cow's milk. How does a deficiency of fat in milk affect the cheese made from it?
2. To what extent does milk produced in Spring usually differ from that produced in Autumn? What variations would you make in the treatment of these two milks for cheesemaking, and why?
3. Why is cleanliness essential in milk production? What defects would you probably find in cheese made from unclean milk?
4. What is the action of rennet on milk, and how can this action be hastened or retarded?
5. Describe difference between colostrum and ordinary milk. Is the former suitable for cheesemaking?
6. What is the function of acidity in cheesemaking, and what would be the effect of too little acidity when making Cheddar cheese?
7. How would you deal with a spongy curd, and what precautions would you take to prevent recurrence of this trouble?
8. What would be the effect of too high temperatures—
 - (a) In making Wensleydale cheese;
 - (b) In ripening Wensleydale cheese?
9. Describe the treatment of Cheshire cheese after the curd is vatted. To what extent can wrong treatment affect quality of cheese?
10. Describe the various points of an ideal room for ripening Cheshire cheese.
11. Describe the treatment of a Stilton cheese after the curd has been put into moulds, and state how far the quality and weight can be affected by careless treatment.
12. What weight of ripe cheese would you expect to obtain from 100 gallons of milk containing 3.6 per cent. fat when made into—
 - (a) Cheddar cheese;
 - (b) Wensleydale cheese?

EXAMINATION FOR BUTTERMILKING CERTIFICATE AT
THE EAST ANGLIAN INSTITUTE, CHELMSFORD;
ON FRIDAY, WEDNESDAY AND THURSDAY, JUNE 25TH,
JULY 4TH AND 5TH, 1928.

EXAMINER: ALEC TODD.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. What do you mean by the term "Butter Ratio"? Give the approximate "butter ratio" of Shorthorn and Jersey milk.
2. What factors govern the production of milk suitable for butter-making?
3. How would you best prepare cream for sale on the open market?
4. What is the effect on the butter—
 - (a) When all the milk is pasteurised?
 - (b) Cream raised in shallow pans?
 - (c) Whole milk churned?
5. What might cause the following faults in butter:—Openness of texture, oiliness, strong rancid flavour; streaky colour?
6. What amount of fat is lost in buttermaking; at what stages in the process does this occur?
7. How is Devonshire Cream prepared, and what yield of cream do you expect to get from the milk?
8. What simple tests might be used with advantage in a butter-making dairy?

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT
THE EAST ANGLIAN INSTITUTE, CHELMSFORD ;
ON FRIDAY, WEDNESDAY AND THURSDAY, JUNE 29TH,
JULY 4TH AND 5TH, 1928.

EXAMINER: ALEC TODD.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. What constitutes a good cheesemaking milk ?
2. Which do you consider the most important in cheesemaking. The percentage of fat in the milk, or the cleanliness ?
3. Why do you develop more acidity in the milk for Cheddar making than for any other variety of cheese ?
4. What do you consider are the chief points in the making of a good Cheshire cheese ?
5. What is the composition of separated milk and whey. How can each be economically utilized, stating methods adopted ?
6. How does the ripening of a hard pressed cheese differ from a blue veined cheese ?
7. Is the look of the cheese in the curing room any guide to you that they are well or badly made ?
8. What is the shrinkage in weight of a Cheddar and Stilton Cheese, from the time they are made till sold. Under what conditions would it be likely to vary ?
9. How would you control the ripening of a soft cheese such as Pont l'Eveque ?

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT THE
STUDLEY COLLEGE, WARWICKSHIRE; ON MONDAY,
AND TUESDAY, JULY 16TH AND 17TH, 1928.

EXAMINER :

MISS D. V. DEARDEN.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Compare the reliability of results obtained by testing new milk with :—
 - (a) Lactometer.
 - (b) Creamometer.
 - (c) Centrifugal tester.
2. What is the most important part of a separator, what different types of this do you know ?
3. What is pasteurisation, to what conditions must the process conform in order that the milk may be sold as pasteurised ?
4. How would you manage cream in a small dairy so as to obtain good-flavoured butter.
5. Give a scale of points suitable for judging butter and give reasons for your allocation.
6. What are the advantages and disadvantages of ripening cream for buttermaking ?
7. What do you understand by "butter ratio." What might be the cause of an unduly wide one ?
8. How can the colour of butter be affected during the process of manufacture ?
9. Under what circumstances will the churning period be prolonged ?

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
STUDLEY COLLEGE, WARWICKSHIRE; ON MONDAY,
AND TUESDAY, JULY 16TH AND 17TH, 1928.

EXAMINER :
MISS D. V. DEARDEN.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. There are different methods available for determining the acidity during cheesemaking. Enumerate these and indicate which you prefer and why ?
2. What factors encourage or retard the action of rennet ?
3. Derby and Cheshire are types of close and open textured cheese respectively. How is the difference obtained ?
4. How does the appearance of cheese in the ripening room indicate good or bad manufacture ?
5. Give what you consider a typical record of a day's cheesemaking in :—
 - (a) Early May
 - (b) Late Septemberof a Cheddar dairy dealing with the milk of 60 cows.
6. How would you produce "whey butter" of good quality ?
7. What conditions are necessary for the manufacture of satisfactory blue veined cheeses ?
8. How do humidity and temperature in the curing room affect the quality of cheese ?
9. Give diagrams to illustrate the construction of a double jacketed cheese vat having steam attachments.
10. What yield per gallon of milk would you expect when making :—
 - (a) Cheddar.
 - (b) Stilton.
 - (c) Wensleydale.
 - (d) Cream cheese.

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT THE
SEALE-HAYNE AGRICULTURAL COLLEGE, NEWTON
ABBOT; ON THURSDAY AND FRIDAY, JULY 26TH AND
27TH, 1928.

EXAMINER:
ALEC TODD.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Describe the method of the production of graded milk on an ordinary farm.
2. Why is there a variation in the composition of milk, what chief factors tend to increase this variation?
3. What is the effect produced on milk by pasteurisation and sterilisation respectively?
4. How is it possible to obtain cream from milk, and what percentage of fat would you expect to have in cream for churning and cream for selling on the open market?
5. What is an ordinary commercial starter, and what are its functions in dairy work?
6. For what economical purposes can you use separated milk and butter milk?
7. How would you test a sample of milk for fat and Solids not Fat?
8. What are the chief factors that affect the flavour, texture and keeping properties of butter?
9. What is Devonshire cream, and how does it differ from ordinary separated cream?

EXAMINATION FOR BUTTERMILKING CERTIFICATE AT THE
AGRICULTURAL INSTITUTION, USK, MONMOUTHSHIRE ;
ON MONDAY AND TUESDAY, AUGUST 13TH AND 14TH, 1928.

EXAMINER :

MRS. M. REEVES.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Describe the secretion of milk, giving diagrams.
2. Give an estimate of the average yield of milk, also the butter-fat percentage, of morning and evening milk, from four popular breeds of dairy cattle. How would a farmer obtain these figures ?
3. How would you handle milk from the time it leaves the cow until it reaches the separator ?
4. What factors are necessary for the production of "Grade A" milk ?
5. State the various natural and artificial methods of obtaining cream :—
 - (a) For fresh cream trade.
 - (b) For buttermaking.
6. What is the composition of what you consider to be a good sample of milk ?
7. Give the causes and results of the fermentation of cream used for buttermaking.
8. Given properly prepared cream, how would you proceed to make good butter ?
9. What are the different results from churning :—
 - (a) Ripened cream ?
 - (b) Scalded cream ?
10. Compare a sample of good butter with three inferior samples containing definite faults. State the causes.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
AGRICULTURAL INSTITUTION, USK, MONMOUTHSHIRE ;
ON MONDAY AND TUESDAY, AUGUST 13TH AND 14TH, 1928.

EXAMINER :
MRS. M. REEVES.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Why is it necessary for milk intended for Cheesemaking to be fresh and free from taints ? Give chief causes of taints often found in milk.
2. How would you prepare and maintain a pure starter intended for use in Cheddar Cheesemaking ?
3. What tests are employed during the manufacture of Cheese, and state how and when they ought to be used ?
4. Give reasons for loss of Butter Fat in Whey—
 - (a) Cheddar Cheese.
 - (b) Caerphilly.
5. Describe a good Stilton Cheese, giving composition.
6. What is the influence of Rennet on Milk ? Why is it necessary to alter the amount used at various seasons ?
7. What weight of ripened Cheese would you expect from 50 gallons of Milk—
 - (a) Cheddar.
 - (b) Stilton.
8. Describe a good Curing Room for Hard Cheese, giving suitable temperature, and what effect too low or too high a temperature would have on the Cheese.
9. How would you select Cheese for despatching to the market in order to obtain the best prices ?
10. Give two methods of making Cream Cheese.

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE. READING: ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 17TH, 18TH,
19TH AND 20TH, 1928.

EXAMINER :

R. H. EVANS, B.Sc.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

DAIRY FARMING AND DAIRY HYGIENE QUESTIONS.

(Only nine questions to be answered.)

1. Draw out an estimate of the cost of growing a crop of swedes on medium soil. What weight of produce would you expect, and how would you value it? Discuss the figures thus obtained.
2. Draw a cross-section of the floor of a cow byre, showing detailed measurements.
3. What is meant by "Soiling" of cattle? Discuss the advantages and disadvantages of the system.
4. Describe in detail the system you would adopt for the improvement of old pasture land.
5. Enumerate the more important (a) signs of health, (b) signs of disease in cattle.
6. Under what conditions do cattle contract milk fever? Describe how you would treat an animal suffering from the disease.
7. Explain the following systems of cattle breeding—
 - (1) Line breeding.
 - (2) Cross breeding.
 - (3) Grading.
8. Milk is sometimes said to be a "good carrier of disease." Discuss this statement, and give a list of the diseases which may be thus carried.
9. Write brief notes on the cost of milk production.
10. Explain the function of the following organs of the animal body—

Lungs—Liver—Spleen—Kidneys.
11. Write down the botanical description of the following :—A grain of oats, barley and wheat; potato, swede, carrot, pea.

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER 17TH, 18TH, 19TH AND 20TH, 1928.

EXAMINER :
MISS M. M. MACQUEEN.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

DAIRYING QUESTIONS.

(*Nine questions to be answered.*)

1. Describe the methods you would employ to increase the quantity and quality of milk given by a herd of dairy cows.
2. To what extent can milk be affected during the process of milking ? Compare hand and machine milking.
3. What influence has the soil of a dairy farm upon milk for (a) buttermaking ; (b) cheesemaking ?
4. Calculate the amount of butter obtainable from 1,000 gallons of milk containing 3.8 per cent. fat.
5. Describe the different methods of obtaining cream from milk, stating the advantages or disadvantages of each.
6. Given 100 gallons of milk, compare the returns you would expect if (a) fresh cream were sold ; (b) clotted cream were sold. State percentage of fat in each, and give value of skim milk.
7. State the percentage of loss which usually occurs between vatting and end of ripening period in the case of (a) Cheshire cheese ; (b) Wensleydale cheese. Give reasons for any excessive loss.
8. Describe the differences in method you would employ when making a quick ripening cheese, and a slow ripening one.
9. What are the chief faults of inferior butter, and how would you prevent these ?
10. Given 100 gallons of milk, what difference would there be in the yield of curd and ripe cheese respectively when making Cheddar, Derby, Wensleydale, Caerphilly, and Stilton cheese ?
11. Give a list of appliances required in a dairy making hard-pressed cheese from a herd of 50 cows, and the cost of same.

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE, READING; ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 17TH, 18TH,
19TH AND 20TH, 1928.

EXAMINER :

T. J. DRAKELEY, Ph.D., F.I.C., F.C.S.

Two hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

CHEMISTRY AND PHYSICS.

(Only six questions to be answered.)

1. Describe in detail the procedure you would adopt to sample and test deliveries of milk at a large dépôt. Draw up a blank table indicating the printed sheets of the analysis record book you would require.
2. In what units may heat be measured? Explain the term *specific heat* and describe with practical details how the specific heat of a solid substance may be determined.
3. What are the distinctive properties of acids and of bases? How would you estimate the exact strength of the acid in a sample of sour milk? Give reasons for each of the steps you describe.
4. A sample of Cheddar Cheese is submitted for analysis. Briefly indicate the analytical methods you would employ, and state approximately what results you would expect to obtain.
5. Write an essay on *one* of the following subjects :—(i) The Manurial Value of Foods; (ii) The Influence of Food Constituents on Milk Production; (iii) The Thermometer, its Construction and its Use in Dairying; (iv) The Water Supply.
6. What is rennet? Describe its method of preparation, and its use. How may the strength of a sample of rennet be estimated?
7. Describe one type of hygrometer, and explain its use in the determination of the humidity of the atmosphere. Of what value is such an estimation of the atmosphere of a cheese store room?
8. How would you (a) detect and (b) estimate the quantity of boric acid in a sample of thick cream?

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE, READING; ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 17TH, 18TH,
19TH AND 20TH, 1928.

EXAMINER :

A. T. R. MATTICK.

Two hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

DAIRY BACTERIOLOGY QUESTIONS.

1. Give an account of the ways in which a tuberculous cow may spread infection either to animals or man.
2. What is meant by "fruitiness" in milk products? With what types of organisms is this fault associated and what is the nature of the changes they produce?
3. Describe the methods of carrying out (a) the methylene blue reductase test, (b) the plate method, for estimating the number of bacteria in a sample of milk. State the reasons which lead you to believe that neither of these methods gives an absolutely accurate measure of the number of bacteria present.
4. Give an account of the chief characteristics of organisms of the *B. coli* group. What is the importance of their presence in milk (a) to the whole milk trade (b) to the cheesemaker?
5. What is meant by the term "thermophilic bacteria"? State where they are most liable to occur in the milk industry and give some account of their appearance when cultivated.
6. Describe the moulds that are associated with the ripening of Camembert Cheese. How does the process of ripening of this type of cheese compare with that of a "blue-veined" type such as Stilton?

EXAMINATION FOR DIPLOMA AT THE BRITISH DAIRY
INSTITUTE, READING; ON MONDAY, TUESDAY,
WEDNESDAY AND THURSDAY, SEPTEMBER 17TH, 18TH,
19TH AND 20TH, 1928.

EXAMINER :

H. W. KERSEY.

Two hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks.

Candidates will subsequently be examined *viva voce*.

BOOK-KEEPING QUESTIONS.

Three questions only to be answered of which No. 1 is compulsory.

Marks are given for neatness and style.

1. On 29th September, 1927, a dairy farmer's assets and liabilities are as follows:—Cash in bank, £196 2s. 9d.; dairy herd, £1,800; dairy produce, £2 10s.; tenant-right, £380; horses and implements, £639; pigs, £165; crops, £200; owing by Staines Dairy Co., £202 13s. 4d.; owing to corn merchant, £50; and to landlord, £212 10s. for half-year's rent.

The following is a summary of the year's transactions:—

BANK RECEIPTS:—

	£	s.	d.
Dairy produce, including amount owing by Staines Dairy Co. on 29th September, 1927	1,829	3	10
Draft cows, heifers and calves	166	10	0
Pigs	450	0	0
Crops	380	0	0
Sundries	28	9	6

BANK PAYMENTS:—

	£	s.	d.
Pedigree dairy bull	63	0	0
Wages	824	0	0
Implements	50	0	0
Rent and Rates (including amount due to the landlord on 29th September, 1927)	439	5	0
Seed, corn and potatoes	110	6	0
Foodstuffs and manures (including amount due to the corn merchant on 29th September, 1927)	880	10	0
Taxes—Landlord's £25, his own £12 12s. 6d.	37	12	6
Private account	250	0	0
Tradesmen's bills and sundries	40	0	0

Sells 15 cwts. cheese at 100s. to F. Brown, who fails and pays 15s. in £.

On 29th September, 1928, he owed his landlord half-year's rent and his corn merchant £85. The value of dairy produce consumed in the house was £60. The Staines Dairy Co. owed him £194 12s. 6d.

He valued his dairy herd at £1,950, dairy produce £12 15s., tenant-right £345, pigs £215, crops £239, his horses and implements depreciated 10 per cent.

Enter the above transactions in the Cash Book, Journal and Ledger (an Analysed Cash Book without Journal may be used if preferred), and show the result of the year's transactions.

2. A smallholder starts with a capital of £500. He does most of the work on the holding himself and finds at the end of the year that his net profit is £150. Do you think that this profit is sufficient to provide a satisfactory remuneration for his management and labour, as well as a reasonable return on his capital?

3. On November 10th, 1927, a dairy farmer sells A.B. 5 cwts. cheese at 105s. 6d.; on November 30th A.B. sends a cheque in settlement. Three days later this cheque is returned by the farmer's bankers marked "Refer to Drawer." Show the entries in the farmer's Ledger and Cash Book.

4. On November 1st, 1927, a dairy factory receives an order from a customer for a 12 lb. Stilton, three cream cheeses and one small Cheddar. The customer encloses a cheque on account for £1 5s. On November 3rd the factory sends carriage forward a 12½ lb. Stilton at 1s. 7d., a 7 lb. Cheddar at 1s. 1d. and three cream cheeses at 9d. The packing case (returnable) was 1s. 3d. Make out the customer's account.

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON MONDAY,
TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER
17TH, 18TH, 19TH AND 20TH, 1928.

EXAMINER :

R. H. EVANS, B.Sc.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. Explain the use of—
 - (1) Steam,
 - (2) Pasteurisation,
 - (3) Refrigeration,in ordinary dairy practice.
2. On some small farms butter is only made twice a week. Describe the management of milk and cream under these circumstances.
3. Draw a diagram of a Lactometer, and explain how far its use in dairy practice may be depended upon.
4. Why does separated milk contain less extraneous matter, than the milk from which it was obtained ?
5. Newly made butter is found to have a taint. Explain what steps you would take to ascertain the cause thereof.
6. How long does well-ripened cream take to churn ? What causes retard its churnability ?
7. What percentage of fat would you expect to find in ordinary butter-milk obtained from churning cream ? How do you account for excessive loss of fat in buttermilk ?
8. Briefly describe what you consider to be an ideal pail for—
 - (a) Milking purposes.
 - (b) Ordinary use in the dairy.
9. Define—
 - (a) Centrifugal.
 - (b) Acidity.
 - (c) Fermentation.
 - (d) Colostrum.
 - (e) Specific Gravity.
 - (f) Density.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT THE
BRITISH DAIRY INSTITUTE, READING; ON MONDAY,
TUESDAY, WEDNESDAY AND THURSDAY, SEPTEMBER
17TH, 18TH, 19TH AND 20TH, 1928.

EXAMINER :

MISS M. M. MACQUEEN.

Three hours are allowed for this paper.

Candidates are requested to make their answers as brief as possible. Each answer should be written on a separate sheet of paper, and the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the Candidate.

Each question carries the same number of marks, and Candidates gaining not less than 60 per cent. will pass.

Candidates will subsequently be examined *viva voce*.

QUESTIONS.

1. To what extent would a deficiency in any of the solid constituents of milk affect the cheese made from it ?
2. Describe some of the commoner taints in milk. What precautions would you take to prevent them affecting the cheese ?
3. What type of milk strainer do you prefer, and why ?
4. Describe the action of rennet on milk. How would you test its suitability for cheesemaking ?
5. Give percentages of acidity at different stages when making (a) Cheshire cheese ; (b) Stilton cheese.
6. Give temperatures at different stages when making (a) Cheddar cheese ; (b) Wensleydale cheese.
7. What is the function of salt in cheesemaking ? Why are some cheeses salted by the brining method ?
8. Describe the treatment of Cheddar cheese after vatting until ready for curing room. To what extent may its value be deteriorated by wrong treatment at this stage ?
9. Give the average composition of whey. What are the causes of an unduly high percentage of fat ?
10. Describe the characteristics of a well made and ripened Cheddar cheese. Give a suitable scale of points for judging cheese.

The British Dairy Farmers' Association.

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The British Dairy Farmers' Association.

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- Abbey, Mrs. Arthur, Didgemere Hall, Roydon, Essex (L.M.).
- Abbot, Richard (Abbot Bros.), Thuxton, Norfolk.
- Abbott, Harold Ray, Grange Hill, Chigwell, Essex.
- Abbotts, Miss L., Hill View, Broughton Road, Banbury, Oxon.
- Ackers, Major Charles P., Huntley Manor, Gloucester.
- Acland, Rt. Hon. Sir Francis D., Bart., P.C., M.P., Sprydoncote, Exeter.
- Adams, John, Broomhurst Farm, Fleet, Hants.
- Adamson, W., Harleyholm, Thankerton, Lanarkshire.
- Adlercron, Brig.-Gen. R. L., C.M.G., D.S.O., Culverthorpe, Grantham.
- Adutt, A. Leon, J.P., Culverden, Gerrard's Cross, Bucks (L.M.).
- Ainscough, J., Fairhurst Hall, Parbold, near Wigan.
- Aldridge, D., Sketchley Hall Farm, Hinckley, Leicestershire.
- Aldridge & Son, Station Road, Gloucester.
- Alexander, G. C., Manor House, Winterbourne Stoke, Salisbury.
- Alexander, W., Home Farm, Eynsford, Kent.
- Alfa-Laval Co., Ltd. (represented by Comdr. A. B. Watts), 34, Grosvenor Road, S.W. 1
- Allan, A. Y., Aitkenbar, Dumbarton.
- Allday, C. J., Fotheringhay Manor, near Peterborough.
- Allen, Arthur, The Manor, Chesterblade, Som.
- Allen, A. D., Mymmead, South Mimms, Middlesex.
- Allen, Bernard, 90, Victoria Street, Bristol.
- Allen, F., Saxondale, Bristol Road, Birmingham.
- Allen, H. C., Brick House Farm, Burwash, Sussex.
- Allen, Peter L. R., Halford Farm, Craven Arms, Salop.
- Allen-Stevens, Capt. T., Wicklesham Lodge, Faringdon, Berks.
- Allom, Sir Charles C., Fairlawn, Totteridge, N. 20.
- Allsup, Miss E., Whittingham Hall, near Preston, Lancs.
- Aluminium Plant & Vessel Co., Ltd. (represented by J. W. Wilson), Point Pleasant, Wandsworth, S.W. 18.
- Ames, Mrs. O., Durfold Hall, Dunsford, Surrey.
- Amos, Arthur, School of Agriculture, Cambridge.
- Anderson, John, 28, Devonshire Place, Newcastle-on-Tyne.
- Anderson, Sir Alan G., K.B.E., Notgrove Manor, Notgrove, Glos.
- Anderson, Sir John, Bart., Westerlea, Gleneagles, Perthshire (L.M.).
- Andrews, Miss M. E., Chalvington Manor, Hellingly, Sussex.
- Anslow, Lord, Bangors Park, Iver, Bucks (L.M.).
- Arbuthnot, W. R., Plawhatch Farm, Sharpthorne, Sussex.
- Ardern, Lawrence, The Hollins, Mansergh, Kirkby Lonsdale (L.M.).
- Ardley, J. S., 43, Culverden Road, Balham, London, S.W. 12.
- Argent, W. A., Ghyll Manor, Rusper, Sussex.
- Arkwright, B. H. G., Brockwood Park, Alresford, Hants.
- Armitage, G. Q., 75, Radcliffe Road, West Bridgford, Nottingham.
- Arnold, Edwin Ross, Milnthorpe, Meads Road, Eastbourne.
- Arthurs, F. W., Burley, Woolton Hill, near Newbury.
- Ashby, J., & Sons (represented by P. H. Bayliss), Brixton Flour Mills, S.W. 2.
- Ashcroft, W., 13, The Waldrons, Croydon, Surrey (H.L.M.).

Ashton, H. S., Trueloves, Ingatestone, Essex.
 Assheton, R. C., Downham Hall, Clitheroe, Lancs (L.M.).
 Astley, J. W., Cracoe Close, Pooley Bridge, Penrith.
 Astley, Reginald B., The Weir House, Alresford, Hants (L.M.).
 Astor, Major The Hon. J. J., M.P., Hever Castle, Edenbridge. (All communications to James Smith, Estate Office, Hever Castle, Edenbridge.)
 Astor, Viscount, Cliveden, Taplow, Bucks.
 Atherton, W. R., 100, Evering Road, Stoke Newington, London, N. 16.
 Atkinson, R. L., 10 & 12, Hotel Street, Leicester.
 Austin, Mrs. G. J., Ellern Mede, Totteridge, N. 20.
 Avis, A. A., Nungatta Station, Pericoe, New South Wales (L.M.).
 Aylesbury Dairy Co., Ltd. (represented by H. T. Warren), 31, St. Peter's-burgh Place, Bayswater, London, W. 2.
 Ayre Brothers (represented by A. Lickiss), The Avenue, High Street, Hull.

BAGLEY, J. H. A., The Old Lodge Farm, Woodmansterne Lane, Carshalton, Surrey.
 Bailey, John.
 Bailey, Thomas L., Hartley Farm, Coulsdon, Surrey.
 Bainbridge, J. M., Gt. Chilmington, Gt. Chart, Kent.
 Bainbridge, Mrs. R. C., Elfordleigh, Plympton, Devon.
 Baker, Charles, Delegarde Farm, Westerham, Kent.
 Baker, Philip, Wildmoor, Alcester Road, Stratford-on-Avon.
 Banks, V., Elephant's Head Hotel, Rosherville, Gravesend.
 Banwell, D. I., Westwood Farm, Keevil, Trowbridge.
 Banwell, J. W., Westwood Farm, Keevil, Trowbridge.
 Banyard, Richard, Nelmes Farm, Romford, Essex.
 Barber, Capt. F., Rotherwood Poultry Farm, Balmoral Road, Morecambe.
 Barclay, A., Manor Farm, Compton, Berks.
 Barclay, Edward Exton, Brent Pelham Hall, Buntingford, Herts.
 Barham, Colonel Arthur S., C.M.G., V.D., J.P., Hole Park, Rolvenden, Kent.
 Barham, G. Titus, Sudbury Park, Wembley, Middlesex (L.M.).
 Barnard, Miss O. M., 13, Dealtry Road, Putney, London, S.W. 15.
 Barnard, W., Kelsey Manor Farm, Beckenham, Kent.
 Barnes, George, Hatherleigh, Wincanton.
 Barnes, Henry, 73, St. Helens Gardens, North Kensington, London, W. 10.
 Barnett, A., Rose Farm, Worleston, Nantwich.
 Barr, Peter, Wilstead, Bedfordshire.
 Barr, Thomas, Hobsland, Monkton, Ayrshire.
 Barrett, Miss A. H. G., The Mount Farm, Farnham Royal, Bucks.
 Bartlett, Stephen, 7, Redlands Road, Reading.
 Barton, G., Carbrooke, Watton, Norfolk.
 Baseden, Mrs. V., Rectory Farm, Sutton Valence, Kent.
 Bassett, Miss B., Hill Top Farm, Ashover, nr. Chesterfield.
 Bastard, William, Woodlands, Barkby, Leicester.
 Bastow, Mrs. H. V., Ray Lodge, Lingfield, Surrey.
 Bates, Oswald F., Hood House, 71, Fleet Street, London, E.C. 4.
 Batho, F., Winston, Ellesmere, Salop.
 Bathurst, Lt.-Col. The Hon. B., 38, Lower Belgrave Street, London, S.W. 1.
 Batten, E. J., Sanatorium Farm, Nayland, Suffolk.
 Baxendale, Lt.-Col. J. F. N., Froxfield Green, Petersfield, Hants.
 Bayley, A., Orchard Bungalow, Lent Rise, Burnham, Bucks.
 Bayley, Comdr. J., R.N., Willaston Hall, Nantwich.
 Bazeley, J. C., Gurlyn Barton, St. Hilary, Marazion, Cornwall.
 Beale, Capt. B. P., M.C., Hillcote Farm, Purley, near Pangbourne, Berks.
 Beatty, A. Chester, Calehill Park, Little Chart, Kent (Agent: F. Watson).
 Beaufort, Duke of, Badminton, Glos.

- Beaumont, Miss B. C., 23, Blenheim Road, Reading.
 Beckett, A., Clive, Middlewich, Cheshire.
 Beckett, John, junr., Chells Hill Farm, Betchton, Sandbach, Cheshire.
 Beckett, T. E., Hall o'Coole, near Nantwich, Cheshire.
 Bedford, Geo. Smith, University College, Reading.
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 Bellamy, Douglas R., Sandfield, Chislehurst, Kent.
 Bennett-Stanford, Lt.-Col. J., Hatch House, Tisbury, Wilts.
 Bennion, Miss Nellie, Cheshire School of Agriculture, Reaseheath, Nantwich.
 Bentall, C. E., Five Corners, Wickham Bishops, Essex.
 Bentall, E. E., The Grove, Witham, Essex.
 Benyon, H. A., Upton Court, near Reading.
 Benyon, J. Herbert, J.P., Englefield House, Reading, Berks.
 Berkeley, R. G. W., Spetchley Park, Worcester.
 Berry, Grosvenor, Mount Bures, Bures, Suffolk.
 Bethell, Thomas P., Crown Works, Boundary Place, Liverpool, Lancs.
 Betts, Walter, Fowler Mill, Charlbury, Oxon.
 Bill, Ernest E., New Mills Dairy, Ledbury, Herefordshire.
 Billson, Mrs. Emily M., Weald House, Heathfield, E. Sussex.
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 Birkbeck, Major H. A., Westacre Abbey, King's Lynn (L.M.).
 Birkbeck, Martin, Poringland, Norwich.
 Birkbeck, Oliver, Little Massingham, Massingham, Norfolk.
 Birkett, E., F.Z.S., F.R.H.S., Crippenden Manor, Edenbridge, Kent.
 Birmingham Dairy Co., Limited (represented by W. T. Harrison), Dalton Street, Birmingham.
 Bishop, J. P., Moor View Lodge, Pennsylvania, Exeter.
 Black, Sir R. A. S., Bart., Midgham Park, Reading (L.M.).
 Blackburn, C., Head Street, Liverpool, Lancs.
 Blackburn, Miss E. M., Cheshire School of Agriculture, Reaseheath.
 Blackshaw, J. F., Restormel, Harlow, Essex.
 Bland, G. R., County Offices, Oxford.
 Bledisloe, Lord, P.C., K.B.E., Lydney Park, Gloucestershire (L.M.).
 Blewitt, G., Boxted Hall, Colchester.
 Blundell, Stanley, Green Gore, Battle, Sussex.
 Body, J. B., M.I.C.E., Hindhead Court, Hindhead, Surrey.
 Bohrmann, A. H. L., Winkhurst Green, Ide Hill, near Sevenoaks (L.M.).
 Bolesworth Trust Co., Bolesworth Castle, Tattenhall, Chester.
 Bolitho, Lt.-Col. E. H. W., Trengwainton, Heamoor, Cornwall.
 Bolton, Edgar O., Leeming, Watermillock, Penrith.
 Bolton, Herbert James, Waltham Cross, Hertfordshire.
 Bond, Capt. K. H., Wood End, Harpenden, Herts.
 Bond, A. F., Lloyds Bank Chambers, New Street, Birmingham (L.M.).
 Booth, G. W., Ion Farms, Lower Gravenhurst, Ampthill, Beds.
 Booth, Miss C. A. M., Yore Croft, Ripon, Yorks.
 Borlace, W. J., Wootton Manor, Henley-on-Thames.
 Boscawen, Lady Margaret F. L., Mount Street, London, W. 1.
 Boscawen, Sir Arthur G., 80, Cornwall Gardens, London, S.W. 7.
 Bostock, E., Gibbet Hill, Kenilworth, Warwickshire.
 Bostock, Harold S., Haslington, Crewe.
 Bourne, A. J., Brough Hall, Gnosall, Staffs.
 Bourne, Felix, 226, High Street, Chatham.
 Bourne, J. H., Hack Green, Nantwich, Cheshire.
 Bourne, T., Baddington, Nantwich, Cheshire.
 Boutflour, R., B.Sc., Harper Adams Agricultural College, Newport, Salop.
 Bowden, F. & Sons, North Court Farm, Clanfield, Oxford.
 Bowden, James, Lance Levy Farm, Sherfield, Basingstoke.
 Bowden, Tom, Vyne Farm, Basingstoke.

- Bowen, Miss May, The Poplars, Milton, Pembroke.
 Bowen-Colthurst, Miss P. de B., L'ayer-de-la-Haye, Colchester.
 Bower, Norman, Smeaton Wood, Wrenbury, Nantwich, Cheshire.
 Bowles, Eustace, Far Croft, Market Drayton, Salop.
 Bowser, Benjamin G., Scothern Manor, Lincoln (L.M.).
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 Boyle, Prof. C., University College, Cork.
 Bradford, William L., Pendleton, Manchester, Lancs.
 Bradish-Ellames, Mrs. A. G., Manor House, Little Marlow, Bucks.
 Brady, W. H., Glan-y-coed, Penmaenmawr, Carnarvon.
 Brake, P. W., Burnt House Farm, Cranmore, Shepton Mallet.
 Brander, Miss Anna E. L. (L.M.).
 Brassey, Capt. R. B., J.P., Cottesbrooke Hall, Northampton (L.M.).
 Bray, Miss Evelyn, County Education Office, The Castle, Exeter.
 Brazil, W., Kidmore Game Farm, Kidmore, near Reading.
 Breakwell, G., Perthyre, Rockfield, Monmouth.
 Bretherton, Miss A., The Moothall, Newcastle-on-Tyne.
 Briggs, Capt. William, St. Clere, Kemsing, Sevenoaks, Kent.
 Briggs, Mrs. H., The Grange, North Stoke, nr. Wallingford.
 Brindley, Frank, Cottage Farm, Sandybrook, Ashbourne, Derbyshire.
 Brine, Miss G. B., c/o Barclays Bank, Old Bank, Oxford.
 Brise, A. W. Ruggles, Spains Hall, Braintree, Essex.
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 Brittain, Arthur, Townsend Farm, Steppingley, Bedford.
 Brittain, Miss M., Somerset Farm Institute, Cannington Court, Bridgwater.
 Brittlebank, Col. J. W., C.M.G., M.R.C.V.S., D.V.S.M., 1, Mount Street, Manchester.
 Brocklehurst, W. S., J.P., Grove House, Bedford.
 Bromet, John, Golf Links Farm, Tadcaster.
 Brook, F. R., Belgrave House, Moretonhampstead, South Devon.
 Brook, Lt.-Col. Charles, Kinmount, Annan (L.M.).
 Brooke, Charles E., Roseberry, Malford Grove, Snaresbrook, E. 18 (L.M.).
 Brooking, W. E., Furzedown, Malborough, Kingsbridge.
 Brooks, C. A., Long Furrows, Mistley, Essex.
 Brooks, C. H., Park Lodge, Mistley, Essex.
 Broom, T. W., Sondes Place Farm, Dorking, Surrey.
 Broome, A., & Sons (represented by W. A. Broome), Preston Brook, Cheshire.
 Broughton, J. F., Yeabridge, South Petherton, Somerset.
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 Brown, A. & J. (represented by Mrs. A. Brown), Hedges Farm, St. Albans.
 Brown, Alexander, Sandford, Wolverton, Basingstoke.
 Brown, A. Milner, Woodlands, Bathealton, Taunton.
 Brown, A. O., Cowley Farm, Ashton, Exeter.
 Brown, D., Beauchamps, Southchurch, Essex.
 Brown, E. J., Thornholme, Brigg, Lincs.
 Brown, Admiral F. C., C.B., C.M.G., Stamford Place, Faringdon, Berks.
 Brown, Frank, Sleaford, High Hurst Wood, Uckfield, Sussex.
 Brown, G. B. M., Manor House, Heacham, near King's Lynn, Norfolk.
 Brown, H. A., Grendon, Atherstone, Warwickshire.
 Brown, James A., 31, Bridge Street, Bristol.
 Brown, John H., Shrewbridge House, Nantwich, Cheshire.
 Brown, Oscar C., Appleby, Lincolnshire.
 Brown, T., The Grove, Kent's Green, Haslington, Crewe.
 Brown, W. C., Appleby, Lincolnshire.
 Bruce, R. J., Elmhurst Farm, Sleaford, Sussex.
 Brunton, W., Tollesby Farm, Marton-in-Cleveland.

- Bryan, Frank, 122, Newgate Street, London, E.C. 1.
 Bryan, Robert, British Dairy Institute, Reading.
 Bryant, H. G., Street Farm, Bovington, Boxmoor.
 Buckley, T. H. W., The Grange, Crawley Down, Sussex.
 Buckley, Wilfred, Moundsmere Manor, Basingstoke.
 Bucknell, J., & Sons, (represented by Mrs. Jane Bucknell), Priory Farm, Beech Hill, Reading (L.M.).
 Buist, H. M., 9 and 10, Gardnor Mansions, Church Row, Hampstead, N.W. 3 (L.M.).
 Bull, A. C., County Dairy School, Sutton Veny, Warminster.
 Bull, Mrs. Ida M., The Offices, Sutton Veny, Warminster.
 Bull, Miss Iris L., 5, Ashen Road, Clare, Suffolk.
 Bullivant, Percy, Tunworth, Basingstoke.
 Burchnell, J. O., Manor House, Aston Flamville, Hinckley.
 Burdon, Col. Rowland, J.P., Castle Eden, Co. Durham.
 Burge, Joseph R., Itchen Down, Itchen Abbas, near Winchester.
 Burgess, J. W.
 Burkitt, William, Grange Hill, Bishop Auckland, Durham.
 Burnard, A. (Burnard & Son), 31, Bond Street, London, S.E. 8.
 Burrell, Lt.-Col. Sir Merrik R., Bart., C.B.E., Knepp Castle, Horsham.
 Burton, Baroness, Dochfour, Inverness.
 Burton, W., Appleby House, Parkstone, Dorset.
 Bush, B. S., Manor Farm, Laverton, near Bath.
 Bush, John H., Peart Farm, Norton St. Philip, Bath.
 Busk, Mrs. M. A., Wraxhall Manor, Dorchester, Dorset.
 Butcher, H. W. (representing O'Brien & Butcher), 37/38, Mark Lane, E.C. 3.
 Butt, Mrs. W. W. W., Eastfield Poultry Farm, North Thoresby, Lincs.
 Butter, Col. C. A. J., Clunimore, Pitlochry, Perthshire.
 Butterwick, Mrs. C., Eton College, Windsor.
 Button, Mrs. A. M., Parklands, Burgess Hill, Sussex.
 Buxton, Capt. R. G., Petygards, Sporle, King's Lynn.
 Buxton, Major G. J., Tockenham Manor, Wootton Bassett, Wilts (Agent:— W. H. Mulland, Estate Office).
 Buxton, Sir T. Fowell, Bart., J.P., Woodredon, Waltham Abbey (L.M.).
 Buzzard, Brig.-Gen. F. A., West Haxted Farm, Edenbridge, Kent.
 Byrne, Miss N. C., 11, Parnell Square, Dublin.

- CADBURY, Mrs. G., M.A., O.B.E., J.P., Manor House, Northfield, Birmingham.
 Caillard, Miss G. L., Devon Banks, West Hill, Ottery St. Mary, Devon.
 Caillard, Sir Vincent, Wingfield House, near Trowbridge, Wilts.
 Cain, Sir Ernest, Bart., Wargrave Manor, Wargrave, Berks.
 Caldwell, James, Moorfield, Kilmarnock.
 Calley, Miss J. M., Burderop Park, Swindon.
 Calthrop Bros., Ltd. (represented by G. A. Squirrel), Naylor Street, Liverpool.
 Calvert, Horatio, Bourne Place, Hildenborough, Kent (L.M.).
 Campbell, R. G., Pickhurst Manor, Hayes, Kent.
 Candler, G. A., 258, Brixton Hill, London, S.W. 2.
 Cannell, George W., Hardley, near Loddon, Norfolk.
 Capstick, E. (Messrs. Aplin & Barrett), Yeovil.
 Carlton, Mrs. F. S., Eastwood Park, Falfield, Glos.
 Carrington, H. B., Blacklands, Crowhurst, Sussex.
 Carson, R. W., 3, Gloucester Gate, Regent's Park, N.W. 1.
 Carter, A. E., Brook House, Great Baddow, Essex.
 Carter, Edward, East Upton, Ryde, Isle of Wight (L.M.).

- Carter, James, & Co. (represented by G. Beale), 129, High Holborn, W.C. 1.
 Carwardine, Mrs. M., Whitcross Court, Whitchurch, near Bristol.
 Cash, T. E., Brockhill Farm, Redditch, Worcs.
 Cataline Co., Ltd. (represented by J. H. Fursdon), Bristol.
 Cater, Mrs. B., 23, South Street, Thurloe Square, London, S.W.
 Cathcart, Miss D., Aubrey Farm, Keyhaven, Lymington, Hants.
 Cecil, Lady Arthur, The Mount, Lymington, Hants.
 Cecil, Lt.-Col. R. E., D.S.O., Passford House, Lymington, Hants (L.M.)
 Chadborn, Dr. C. N., 10, Cambridge Road, Hove, Sussex.
 Chadburn, C. W., Papplewick Hall, Nottinghamshire.
 Chalk, Vernon Beecher, Beckenham, Kent.
 Chalmers, W. S., Moothall, Newcastle-on-Tyne.
 Champion, R. W., 41, Triangle West, Clifton, Bristol.
 Champion Bros., Mill Farm, Steeple Ashton, Trowbridge.
 Chance, S. M. M. C., M.A., Spinningdale, Bonar Bridge, Sutherland.
 Chaplin, Col. J., The Brow, Overton, Ellesmere, Salop.
 Chapman, Frederick, Chevet Grange, Wakefield.
 Cheke, Miss V. E., The Cockpit, Fair Oak, Hants.
 Chick, John H., Wynford Eagle, Dorchester, Dorset.
 Chick, W. D., Compton Valence, Frampton, Dorchester, Dorset.
 Chillingworth, A. F., & Sons (represented by A. F. Chillingworth), Reddown Farm, Highworth, Wilts.
 Chiswick Soap & Polish Co. (represented by C. Mason), Chiswick, W. 4.
 Chivers & Sons, Ltd. (represented by John Stanley Chivers), Histon, Cambs.
 Christie, Capt. J., M.C., Glyndebourne, Ringmer, Lewes.
 Clapham, G., Bowbrook, Shrewsbury.
 Clare, A. J., Market Place, Wells, Somerset.
 Clark, H. J., Oldner House, Chipping Norton, Oxon.
 Clark, Thomas, Beeches Farm, Botcherby, Carlisle.
 Clarke, Col. Stephenson R., C.B., J.P., Borde Hill, Cuckfield, Sussex.
 Clarke, E. H., Cossington Grange, Leicester.
 Clarke, E. W., Chilborough House, Aylesbury, Bucks.
 Clarke, P. R., Boltons Park Farm, Little Heath, Potter's Bar.
 Clarke, R. A., & Sons (represented by C. J. Clarke), Manor Farm, Chiselborough, Stoke-under-Ham.
 Clay, Col. H. H. Spender, C.M.G., Ford Manor, Lingfield, Surrey.
 Clayton, G. S., St. Anne's Works, St. Anne Street, Limehouse, E. 14.
 Cleeves, C. E., J.P., Sproutes, Coolham, Sussex.
 Clement, Sir Thomas, 27, South Albion Street, Glasgow.
 Clifford, Major A. F., J.P., Park Place, Wickham, Hants.
 Clifton-Brown, E., J.P., Burnham Grove, Burnham, Bucks (L.M.).
 Coalston, H., Homebank, Haddington, Scotland.
 Coates, Richard, Summerford, Withyham, Sussex.
 Cochrane, A., Nether Craig, Kilmarnock (L.M.).
 Cochrane, J., West of Scotland Agricultural College, Kilmarnock.
 Cochrane, John, Byreholm, Thornhill, Dumfriesshire (L.M.).
 Cochrane, M., Catlins, Lockerbie, Dumfriesshire.
 Cocks, Peter, Fardel, Ivybridge, S. Devon.
 Codd, J. F., Seale Hayne Agricultural College, Newton Abbot.
 Coghurst Estates, Ltd. (represented by S. G. Metianu), Coghurst Hall, Hastings.
 Cohen, Miss C. E., 31, Oxford Square, London, W. 2.
 Cole, G. H., Adley, Chagford, Devon.
 Cole, G. R., Home Farm, Over Compton, Sherborne.
 Cole, Henry F., Tilly Manor Farm, West Harptree, Bristol.
 Cole, W. E., Dyrham, Staple Hill, near Bristol.
 Colebrook, W. M., The Meadows, Claygate, Surrey.
 Collet, Sir Mark E., Bart., St. Clere, Kemsing, Sevenoaks.

- Collins, Rev. R. L., St. Luke's College, Exeter.
 Collins, William, Crafton, Leighton Buzzard, Beds.
 Collins, W. H., Whitehouse Farm, Bruton, Somerset.
 Colnett, Miss A., County Offices, Oxford.
 Colt, W. H., Ltd., Bush House, Aldwych, London, W.C. 2.
 Compton, A. H., 136, Kensington Park Road, London, W. 11 (L.M.).
 Comyns-Lewer, Mrs. E., 2, Oakwood Avenue, Beckenham, Kent (L.M.).
 Conroy, George L., Douglas Wharf, Putney, London, S.W. 15.
 Constable, Mrs. M., Nizels Hoath, Hildenborough, Kent.
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 St. Mary Cray, Kent.
 Cook, William H., Cook's Poultry Farm, Ltd., Orpington, Kent.
 Cooke, Miss W. M., Crook Farm, Denton, Ben Rhydding.
 Cooper, Cecil M., Tudor House, Haslemere.
 Cooper, Major R. W., Rush Court, Wallingford, Berks.
 Cooper, Sir George A., Bart., Hursley Park, Winchester (Agent: T. W. Ashton,
 Estate Office, Hursley Park, Winchester, Hants).
 Coote, Col. Charles H. Eyre, Highgate House, Creaton, Northampton.
 Copeland, L. F., The Slade Farm, Hedgerley, Farnham Royal, Bucks.
 Copleston, Mrs. T. H. H., Widworthy Rectory, Honiton, Devon.
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 Corfield, Capt. R., Imperial Works, Morden Road, Mitcham (L.M.).
 Cornall, Fred, The Hermitage, Holmes Chapel, Cheshire.
 Corner, Dr. Harry, Brook House, Southgate, N. 14.
 Cornish, Mrs. C. J., Steyne, Bembridge, Isle of Wight.
 Corrie, Harold, Heath House Farm, Lowfield Heath, Surrey.
 Coryton, Capt. J. T., Pentillie Castle, St. Mellion, Cornwall.
 Coryton, Miss J. E. L., Fursdown, Plympton, S. Devon.
 Cory-Wright, Mrs. A., Northfields, Sawbridgeworth, Herts.
 Coster, J., & Sons (represented by J. Coster), Gouda, Holland.
 Courtenay, Capt. P. D. A., Greenlawn, Burnham-on-Sea, Somerset.
 Courthope, Col. Sir G. L., Bart., M.P., Whiligh, Sussex.
 Coward, Miss F., Cumberland & Westmorland Farm School, Newton Rigg,
 Penrith.
 Cowdray, Viscount, Cowdray Park, Midhurst, Sussex.
 Cowell, Miss Mary A., Callows Hill, Ledbury, Herefordshire.
 Cowlard, Mrs. P., Stuart Lodge, Appleshaw, Andover.
 Cowley, William A., Ovingdean Grange, near Brighton, Sussex.
 Cox & Sons (represented by A. Cox), Northwold Buildings, Northwold
 Road, Stoke Newington, London, N. 16.
 Cox, Harry T., Bishops Stortford Dairy Farms, Bishops Stortford, Herts.
 Cox, James, jun., Manor Road Farm Dairy, Barnet, Herts.
 Cox, Miss E. Lilian, Chewton Field Farm, Chewton Mendip, Bath, Somerset.
 Cox, Miss J., 13, Appian Way, Leeson Park, Dublin.
 Cox, William J., The Cardiff Milk Supply, City Road, Cardiff, Glam.
 Crabtree, G., Greystone Manor, Burley-in-Wharfedale.
 Crabtree, James, 25-39, Price Street, Birkenhead, Cheshire (L.M.).
 Cranfield, H. T., Midland Agricultural and Dairy College, Sutton Bonington,
 Loughborough.
 Cranworth, Lord, Grundisburgh Hall, Suffolk.
 Crawford, Miss A. W., P.O. Box 367, Palmerston North, New Zealand.
 Crawford, Hugh W. B., Forneth, Castle Douglas.
 Crawford, Lady Gertrude, Coxhill, Lymington, Hants (L.M.).
 Crawford & Cox, The Misses, Cottage Farm, Warsash, Southampton.
 Crawler, Miss F. M., N.D.D., B.D.F.D., 1, Richmond Road, Exeter.
 Crewe, Marquis of, P.C., D.C.L., Crewe House, Curzon Street, W. (com-
 munications to Prof. W. McCracken, Englesea House, Crewe).

Crombie, T. A., Estate Office, Bawdsey, Woodbridge, Suffolk.
 Crompton, Chas. W., Hall Green, near Wakefield, Yorks.
 Crompton, James R., Greenhayes, Banstead, Surrey.
 Cross, George, British Empire Hotel, De Vere Gardens, Kensington, W. 8
 Cross, Major J. K. C., Wyke Hall, Gillingham, Dorset.
 Cross, J. L., Catthorpe, Rugby.
 Crow, Robert, Jealots Hill Farm, Bracknell, Berks.
 Crowe, John, The Manor, Ashe, Overton, Hants.
 Crowson & Son (represented by I. Bidwell), 61, Charterhouse Street, E.C. 1
 Croxon, A. B., The Limes, Burnham-on-Crouch, Essex.
 Crumpler, Jesse, Longlands, North Coker, Yeovil.
 Crutcher, G. J., Duncroft Lodge, Reigate, Surrey.
 Cruwys, R. L., Sherwood, Sidmouth Junction, Devon.
 Cumber, W. J., Theale, Berkshire.
 Cundy, J. P., Estover, Crownhill, nr. Plymouth.
 Cupiss, F., Ltd. (represented by W. Clarke), The Wilderness, Diss, Norfolk.
 Currie, Laurence, Minley Manor, Farnborough, Hants.
 Curtis, Mrs. C. J., 46, Merton Hall Road, Wimbledon, London, S.W. 19.
 Curtis, R., Edina, Stoneycote, Leicester.
 Curtis, W., Berwick Manor Farm, Rainham, Essex.
 Curzon, C., Westaway, Milford Haven, Pembrokeshire.

DAIRY, THE (represented by J. W. Hand), 21, Farringdon Avenue, E.C. 4.
 Dairy Outfit Co., Ltd. (represented by W. P. Freeth and J. H. Stanley), 251,
 Pentonville Road, King's Cross, London, N. 1.
 Dairy Supply Co., Ltd. (represented by Capt. C. C. F. Smith, M.C.), Museum
 Street, W.C. 1.
 Dalrymple, Miss Mary, Elliston, St. Boswells.
 Dalrymple-Hamilton, Col. N., Bargany, Girvan, Ayrshire (L.M.).
 Daresbury, Lord, C.V.O., Walton Hall, Warrington (Agent: Capt. J. Bain-
 bridge, Walton Estate Office, near Warrington).
 Darling, F., Education Sub-Office, Aylesbury.
 Darlington, J., Pitton Grange, Burlton, Shrewsbury.
 Darrell, Miss Mary, Ebberston, Snainton, S.O., Yorkshire.
 Dartmouth, Earl of, P.C., K.C.B., Patshull, Wolverhampton.
 Davidson, J. D., 5, Pembroke Terrace, Cardiff.
 Davies, Ben, 28, King Street, London, W. 1.
 Davies, Miss Alice, Llysfas Farm Institute, Ruthin, Denbighshire.
 Davies, B. L., Pantyrhaidd, Boncath, S. Wales.
 Davies, Edward, Plas Power Home Farm, Wrexham.
 Davies, General H. F., Elmley Castle, Pershore (L.M.).
 Davies, H. J. P., Pixley Court, Ledbury.
 Davies, J. E., 10 & 11, Dukes Road, Tavistock Square, W.C. 1.
 Davis, Colonel, Salt Hill House, Slough, Bucks.
 Davy, A. Cedric, Paternoster Row, Sheffield, Yorks.
 Dawson, George (Dawson Bros.), Leeds, Yorks.
 Dawson, Miss E. M., 1, College Hill, Shrewsbury.
 Day, C. F. (representing Day & Day), 237-239, Lower Clapton Road, E. 5.
 Day, Charles T., 237-239, Lower Clapton Road, Clapton, London, E. 5.
 Day, John, Huxham, Shepton Mallet.
 Day, Major E. C., Becketts, Chiddingstone, Kent.
 Day, Son, & Hewitt (represented by G. S. Hewitt), 22, Dorset Street,
 W. 1 (L.M.).
 Dean, F. W., St. Germain's Farm, St. Albans, Herts.

- Dearden, Miss D. V., British Dairy Institute, Reading.
 De Bathe, Lt.-Col. Max, c/o Lloyds Bank Ltd., 6, Pall Mall, London, S.W.1.
 Debenham, Miss Alice (representing Messrs. E. R. & A. Debenham), Bladen Dairy Farms, Briants Puddle, Dorchester.
 de Clermont, P. E., Ivy House, Lingfield, Surrey.
 de Garis, E., Myrtle Place, Castel, Guernsey.
 de Kusel, C., 32, Iron Mill Lane, Crayford, Kent.
 De la Warr, Earl, Fishers Gate, Withyham, Sussex.
 Delmé-Radcliffe, Lt.-Col. A., D.S.O., Shenley House Farm, Headcorn (L.M.).
 Dempster, A. P. F. (W. Storer, Ltd.), Aldwych House, Aldwych, W.C.2.
 Denchfield, F. T., Manor House Tingwick, Buckingham.
 Dennis, Mrs. Cyril, Oakley Hall, Market Drayton, Salop.
 Derisley & Son (represented by L. R. Derisley), Devonshire House, Byfleet.
 de Rothschild, James (communications to P. S. Woolf, Estate Office, Waddesdon, Bucks).
 Desborough, Lord, G.C.V.O., Taplow Court, Taplow, Bucks.
 de Trafford, Sir H. E., Bart., Newsells Park, Barley, Royston.
 de Wackenfelt, M., Swedish Legation, 27, Portland Place, W.1 (H.L.M.).
 Dewar, Lord, The Homestall, East Grinstead, Sussex.
 Dewe, W., Ashampstead, near Reading.
 Dickie, Robert, Knockenjig, Sanquhar, Dumfriesshire.
 Dickinson, B. O., Pharos, Burnham-on-Sea, Somerset.
 Dickson & Robinson (represented by F. Robinson), Cathedral Street, Manchester.
 Dickson, Miss K., Sutton Place Cottage, Abinger, Surrey.
 Dillon, Miss A. D., 7, Dyke Parade, Cork.
 Dimmock, J. B., Shotford Hall, Harleston, Norfolk.
 Dobson, P., Manor Farm, Ridgwardine, Market Drayton.
 Dodd, F. R., F.I.C., F.C.S., 59, Victoria Street, Liverpool.
 Dolbear, John, Queen Street, Newton Abbot, Devon.
 Done, John, Manor House, Malpas, Cheshire.
 Doughty, Wilfrid V., J.P., Ickleford Manor, Hitchin, Herts.
 Douglas, Comdr. C. A. O., R.N., Hazells, Newbury.
 Douglas, John, 142, Hanham Road, Kingswood, Bristol.
 Douglas, Loudon Macqueen, Newpark, West Calder, Midlothian.
 Dover, J. G., The Homestead, Gt. Missenden, Bucks (L.M.).
 Doyle, Miss A. M., Munster Institute, Cork.
 Doyle, Miss J., c/o Secretary, Committee of Agriculture, Monaghan, Ireland.
 Drakeley, Dr. T. J., Ph.D., M.Sc., F.I.C., F.C.S., M.I.M.E., 69, Rosebery Road, Muswell Hill, London, N. 10.
 Drew, Edward T., 110, Dunvegan Road, Eltham, S.E. 9.
 Drummond, J. N., Bargower, Hurlford, Ayrshire.
 Drummond, Prof. R. J., 21, Portland Road, Kilmarnock.
 Ducie, Earl of, Tortworth Court, Falfield, Glos.
 Ducker, N. B., Thorney House, Thorney, Colnbrook, Bucks.
 Dudgeon, Major C. Randolph, Cargen-Holm, Dumfries.
 Dugdale, A. N., Dutton Manor, near Longridge, Preston.
 Dugdale, Major J. Gordon, The Abbey, Cirencester.
 Duncan, John, Kingston-on-Soar, Derby.
 Dunkels, W., Fernhill Park, Windsor Forest, Berks.
 Dunlop, George, Craigaploch, Castle Douglas.
 Dunlop, Quintin, Greenan, Ayr.
 Dunn, Henry, 153, Mount View Road, Harringay, N. (L.M.).
 Dunstan, Mrs. R. J., Porloe, Mylor, near Falmouth.
 Dunstan, R. J., Porloe, Mylor, near Falmouth.
 Dutton, B. T., Brindley Hall, Nantwich (L.M.).
 Dutton, S. L., Woodside, Wettenhall, Winsford, Cheshire (L.M.).
 Dwight, A. G., Ashton, Wimborne, Dorset.
 Dyer, W. T., Grauntcourts, Rayne, Essex.

- EARL, Henry F., Middle Farm, Fontmell Magna, Dorset.
 Eastment, C. G., Grove Farm, Warfield, Bracknell, Berks.
 Easton, Edward G., 43, Gt. Tower Street, London, E.C. 3.
 Eaton, George T., Thurston Hall, Framfield, Sussex.
 Ebdon, Miss M. P., West Farm, Fulwell, Sunderland.
 Edmead, John W., Bury Fields House, Guildford.
 Edwards, Henry, Hofland Road, West Kensington, London, W. 14.
 Edwards, John, Newton, Ellesmere, Salop.
 Edwards, Lt.-Col. C. W., Woolston, North Cadbury, Somerset.
 Edwards, Major B. M., Hardingham Hall, Hingham, Norfolk.
 Edwards, Miss Katie, Ty-draw Farm, Nelson, near Cardiff.
 Edwards, Sidney, Tynewydd, Castleton, Cardiff.
 Edwardes-Ker, Lt.-Col. D. R., Seale Hayne Agricultural College, Newton
 Abbot.
 Eglinton and Winton, Earl of, Eglinton Castle, Irvine, Ayrshire.
 Elce, Mrs. Amy, Barings Field, Newdigate, Surrey.
 Ellinger, Prof., Landbohøjskole, Copenhagen (H.M.).
 Elliott, C. C., Oxleys Farm, Wing, Leighton Buzzard.
 Ellis, G. W., Brinning, Moretonhampstead, S. Devon.
 Elmhirst, L. K., Dartington Hall, Totnes, Devon (L.M.).
 Elmhurst Farming and Trading Co., Ltd. (represented by H. St. George
 Voules), Elmhurst Farm, Slinfold, Sussex (L.M.).
 Elwes, Lt.-Col. W., Oakdale, Ockley, Surrey.
 Emberlin & Co., Ltd. (represented by J. Wilford), Market Place, Leicester.
 Emberton, William, Home Farm, Doddington, Nantwich, Cheshire.
 Emerton, Frank, 78, Grange Drive, Winchmore Hill, N. 21.
 Emerton, H. J., Halesworth, 76, Windmill Hill, Enfield.
 Enamelled Metal Products Corporation, Limited (represented by C. J.
 Porter), 56, Kingsway, London, W.C. 2.
 Enoch, Arthur Guy, Dutch House, Raglan Gardens, Wembley Park.
 Enock, G., Margaret Street Works, Windus Road, N. 16 (L.M.).
 Enock, A. G., & Co., Ltd. (represented by E. C. Rayner), Thane Works,
 Angel Road, Edmonton, N. 18.
 Entwisle, J. F., Crigglestone Manor, nr. Wakefield.
 Errington, Roger, Victoria Mills, Sunderland.
 Erwood, H. J., 47, Whitworth Road, Plumstead, London, S.E. 18.
 Evans, J., Harrington House, Cheltenham.
 Evans, Miss D. M., University College of Wales, Aberystwyth.
 Evans, J. M., 34, Westbourne Terrace North, Paddington, W. 2.
 Evans, Richard H., Barclays Bank Chambers, Pwllheli, Carnarvonshire.
 Evans, Miss R. M., Agricultural Offices, Lampeter, Cardiganshire.
 Evans, Sir Walter H., Bart., Wightwick Hall, near Wolverhampton.
 Evelyn, Mrs. J. H. C., Wotton House, near Dorking, Surrey (all com-
 munications to Estate Office, Wotton, Dorking.)
 Evens, John, Burton, Lincoln.
 Evens, John, junr., Burton, Lincoln (L.M.).
 Evens, Thomas, Ramsland, Ycalmpton, Devon.
 Everard, W. Lindsey, Ratcliffe Hall, Leicestershire (L.M.).
 Eves, H. J., Allington, Bridport, Dorset.
 Ewing, Hugh, Birtley Farm, Bramley, Guildford, Surrey.
 Ewing, M., Ashlands House, Crewkerne, Somerset.
 Ewing, W., Gate Street Farm, Bramley, Surrey.
 Exeter Co-operative & Industrial Society, Ltd. (represented by F. Hanna-
 ford), 6 & 7, Eastgate, Exeter.
 Express Dairy Company, Limited (represented by R. H. Hewson), Tavistock
 Place, London, W.C. 1.
 Ezra, Capt. E., Lock, Partridge Green, Sussex (Agent: F. P. Musgrave).

- FANE, J. Onslow, Steventon Manor, near Basingstoke (L.M.).
 Farmer, John T. H., Devonian, Cippenham, Bucks.
 Farmers' and Cleveland Dairies Company, Ltd. (represented by J. T. Horner),
 12 and 13, East Street, Gifford Street, Caledonian Road, London, N. 1.
 Farmers' Clean Milk Dairies, Ltd. (represented by T. W. Steer), 16/18, Greyfriars Road, Reading.
 Fawkes, F. H., Farnley Hall, Otley, Yorks.
 Fawkes, Tennyson, Church Farm, Leonard Stanley, Stonehouse, Glos
 Fearnall, P., Calverhall, Whitchurch, Salop (L.M.).
 Feilding, Lt.-Col. Viscount, C.M.G., D.S.O., Street Ashton House, Rugby.
 Fenn, H. E., Market Buildings, Guildford.
 Fewings, J. H., Ferndale, Bream, Glos
 Fewson, Mrs. A., 17, Ripplevale Grove, Barnsbury, London, N. 1.
 Fifer, A., Ltd. (represented by A. Fifer), Trading Estate, Slough.
 Finch, J. W., Market Buildings, Guildford.
 Fish, A. R., Holme Mead, Hutton, near Preston.
 Fisher, Charles V., Crescent Farm, Sidcup, Kent.
 Fisher, Fred T., Pinkneys Court, Pinkneys Green, Maidenhead (L.M.).
 Fison, Joseph, & Co., Ltd. (represented by Harry M. Ennals), Ipswich.
 FitzGerald, Lady, Buckland, Faringdon, Berks.
 FitzGerald, Mrs. M. M., Marsden Manor, Cirencester.
 FitzGerald, Sir John, Bart., M.C., Warren House, Stanmore.
 FitzHugh, G. E., Plas Power, Wrexham.
 FitzRoy, Capt. The Hon. E. A., M.P., Fox Hill, West Haddon, Rugby.
 Fitzwalter, Lord, Goodnestone Park, near Canterbury, Kent.
 Fletcher, H. G., The Galloway Creamery, Ltd., Stranraer.
 Fletcher, Miss M. J., 28, Park Road, Chelmsford.
 Folkestone, Viscount, Longford Estate Office, Alderbury, Salisbury (L.M.).
 Follett, Lt.-Col. H. S., C.B.E., Rockbeare Manor, near Exeter.
 Follows, A. J., Metchley Park, Edgbaston, Birmingham, Warwickshire.
 Foot, Asher, Manor Farm, Charlton, Shepperton.
 Foot, Mrs. R. M., White Hill, Berkhamsted (L.M.).
 Forester, Capt. F., M.F.H.
 Forshaw, James, & Sons, Stud Farm, Carlton-on-Trent, Newark.
 Fortescue, Earl, Castle Hill, South Molton, North Devon (L.M.).
 Fortescue, George G., Boconnoc, Lostwithiel, Cornwall.
 Forteviot, Lady, Dupplin Castle, Perthshire.
 Forteviot, Lord, Dupplin Castle, Perthshire (L.M.).
 Fortnam, Joseph T., Rudge Manor, Ashley, Market Drayton.
 Fortune, Robert, Newhouse, Cranleigh, Surrey.
 Foster, A. V. B., Wrawby Top, Brigg, Lincs.
 Foster, Thomas, 27, Church Street, Ormskirk, Lancs.
 Four Oaks Spraying Machine Co. (represented by W. C. G. Ludford), Four
 Oaks, Sutton Coldfield, Birmingham, Warwickshire.
 Fowler & De la Perrelle (represented by T. W. Bridger), Porters Lane,
 Southampton.
 Fowler, W. Herbert, J.P. (L.M.).
 Fownes, Mrs. I., Briar Thicket, Yetminster, Sherborne, Dorset.
 Foxton, J., Benningholme Hall, Skirlaugh, near Hull.
 Francis, E. J., Manor Farm, Stour Provost, Gillingham, Dorset.
 Francis, F. S., Wilkin Throop Farm, Templecombe, Somerset.
 Franklin, Mrs. C., Chartridge Lodge, Chesham, Bucks.
 Franklin, H., Coltsfoot Farm, Datchworth, Herts.
 Frederickson, Capt. F., Holbrook, Ockley, Surrey.
 Freeman, Miss Z. S., Dial House, Shepperton-on-Thames.
 Freeth, H. C., 93, Redland Road, Bristol.
 French, G., 16, Winterwell Road, Brixton Hill, London, S.W. 2.

French, W. T., & Son (represented by A. E. French), St. Mary Street, Ladywood, Birmingham.
 Freshney, S. D., Horkstow Hall, Barton-on-Humber, Lincs.
 Fricker, B. J., East Sussex Agricultural Institute, Plumpton, Sussex.
 Frieland, H. N., 67, Scrutton Street, London, E.C. 2.
 Frost, E. G. G., J.P., West Watting Hall, Cambridge.
 Fuller, Dr. I. C., Three Counties Mental Hospital, Stotfold, Baldock, Herts.
 Fuller, Major Robert F., J.P., Great Chalfield, Melksham, Wilts (L.M.).
 Fullwood & Bland (represented by C. Bland), 31, Beviden Street, Hoxton, N. 1.
 Fulton, Robert, Rectory Farm, Ridgeway, Enfield.
 Furber, P. J., Melton Lodge, Whitchurch, Salop.
 Furneaux, G., Luson, Yealmpton.
 Furneaux, J. E., Sparkwell, Staverton, Devon.
 Furness, E., Gt. Amwell House, Ware, Herts.
 Furze, J. R., Stanford Rivers, Ongar, Essex.

GABELL, C. D., Ltd. (represented by C. D. Gabell), 104, Albion Road, Stoke Newington, London, N. 16.
 Gamage, A. W., Ltd. (represented by John S. Parker), Horticultural Dept., Holborn, E.C. 1.
 Gardner, Mrs. Chas. H., Rectory Farm, Pulloxhill, Ampthill, Beds.
 Garlick, L. K., Park Head, Wrotham, Kent.
 Garne, W. T., Aldsworth, near Northleach, Glos. (L.M.).
 Garner, Frank H., University Farm, Huntington Road, Cambridge.
 Garnett, G., The Park, Eccleshill, Bradford.
 Garrad, G. H., Springfield, Maidstone.
 Garrard, F. R., The Hall, Framlingham, Suffolk (L.M.).
 Garrard, Miss M. C., Sanforth, Clevedon, Som.
 Gartons, Ltd. (represented by Thomas E. Miln), Warrington
 Gascoigne Co., Ltd. (represented by G. H. Gascoigne), Lyndford House, Castle Street, Reading.
 Gates, J. H., East Haddon Grange, Northants.
 Gedge, E. E., 130, Golders Green Road, London, N.W. 11.
 Gerrard, Miss A., Huddington, Droitwich.
 Ghosal, B. N., 36, Snow Hill, London, E.C. 1.
 Gibson, J. & H., Priestlands, Dumfries.
 Gibson, Mrs. M., Knapp Farm, Whitestaunton, near Chard, Som.
 Gilbert, C. E.
 Gilbert, F. W., The Lawn, Chellaston, Derby.
 Gilbert, F. W. H., junr., The Manor, Chellaston, Derby.
 Gilbert, W. H. R., The Cottage, Aston Flamville, Hinckley.
 Giles, Henry, Stockers Farm, Rickmansworth, Herts.
 Gillett, Arnold, Ridgewood, Chorley, Lancs.
 Gilmour, W. P., Balmangan, Kirkcudbright.
 Gisborne, Col. L., C.M.G., Lingen Hall, Brampton Bryan, Herefordshire (L.M.).
 Gittins, William H., The Hall Farm, Ruyton-of-the-Eleven Towns, Shropshire.
 Glazebrook, R., The Lydiat, Willaston, Cheshire.
 Glazebrook, W. R., Manley Hall, Overton Bridge, Wrexham.
 Glossop, C. W. H., The Lund Dairies, Bramwith, near Doncaster.
 Gloucester Incubator Co., Ltd. (represented by E. L. Godfrey), Woodchester Mills, near Stroud, Glos.
 Glover, Wilfred, The Retreat, Willoughby, Waterleys, near Leicester.
 Godfrey, J. N., Sharpenhoe, near Ampthill, Beds.

- Godfrey, John, & Co., Ltd. (represented by C. B. Carter), Railway Gates, Stamford.
- Golden, G. P., Eaglesfield, Leire, Rugby.
- Golding, Capt. John, D.S.O., Cutbush Lane, Shinfield, near Reading.
- Golding, W. J., Bowens, Penshurst, Kent.
- Goldsmiths & Silversmiths Co., Ltd. (represented by J. W. Rice), 112, Regent Street, London, W. 1.
- Good Rich Products Co., Ltd. (represented by J. Stenton), 90, Freeman Street, Grimsby.
- Goode, C. N., The Croft, Bedford Road, Rushden, Northants.
- Goodwin, P., Bubney, Whitchurch, Salop.
- Goodwin, Thomas C., Leighton Grange, Crewe.
- Goodwin-Courtman, E. G., Universal Farm Requisite Stores, Newnham, Glos.
- Gordon, Miss M. E., 51a, Ashby Road, Loughborough.
- Goschen, Kenneth, Swanthorpe House, Crondale, Hants.
- Gosney, G. F., Cecil Chambers, Room 412, 76/86, Strand, W.C. 2.
- Gould, R. P., Beech Croft, Costessey, Norwich.
- Grabham, A., 139, Englefield Road, Essex Road, London, N. 1.
- Grace, E. G.
- Graham, S., Horton Hall, Small Dole, Sussex.
- Graham, Wm., Eden Grove, Kirkbythore, Penrith, Cumberland (L.M.).
- Grant, A. P. F., M.B.E., Kirby Hall, Horton Kirby, Kent.
- Grant, Mrs. M. A., Kirby Hall, Horton Kirby, Kent.
- Grant, Reginald, Box 23, Shaw Nigan Lake, British Columbia.
- Grant, R., Customs Branch, Australia House, Strand, W.C. 2.
- Grant, W. J., 42, Llanthewy Road, Newport, Mon.
- Grattan, A. H., Folly Farm, St. Osyth, Clacton-on-Sea.
- Gray, George E., Fairstead, Great Warley, Essex (L.M.).
- Gray, J. G., Rosehill, Coventry.
- Gray, Robert, The Manor, Lechlade, Glos.
- Grayson, Thomas, 16 and 17, Queen Street, Derby.
- Great Western and Metropolitan Dairies, Ltd. (represented by Sir Wm. Price), 34, Palace Court, Bayswater, London, W. 2.
- Green, A. W., Stoke Abbey Farm, Stoke Bishop, Bristol.
- Green, Edward, Ina Works, Ingatestone, Essex.
- Green, H., Dudwell Farm, Chewton Mendip, Bath.
- Green, M. H., Caludon, Wyken, near Coventry.
- Greenslade, A. T., Little Walden Park, Saffron Walden.
- Greenway, Capt. the Hon. C. K., 13, Wilton Crescent, London, S.W. 1.
- Greenwood, Lt.-Col. Charles S., M.B.E., J.P., Swarcliffe, Birstwith, Harrogate.
- Gregory, J., Barge Farm, Taplow, Bucks.
- Gregory, W., & Co., Ltd. (represented by W. Gregory), Wellington, Somerset.
- Gregson, P. L., Hearts Hill, Loughton, Essex.
- Grehan, Miss Rita, 7, St. Mary's Road, Dundalk.
- Grierson, R., Cleudrie, Kirkcolm, Stranraer.
- Griffin, E., 84, High Street, Slough.
- Griffin, J. Whitehouse (L.M.).
- Griffith, M., B.Sc., County Offices, Dolgelley, Merionethshire.
- Griffiths, Miss M. F., 1, St. Peter's Terrace, Cambridge.
- Grimsdale & Sons, Ltd. (represented by E. W. Grimsdale), 54, Great Tower Street, London, E.C. 3.
- Grimsdell, Henry John, 36, Snow Hill, London, E.C. 1.
- Grindey, J., 5, Stibbington Street, St. Pancras, N.W. 1.
- Guinness, the Rt. Hon. W. E., 10, Grosvenor Place, London, S.W. 1.
- Gulliver, J. E., Westbury Farm, Purley, near Reading.
- Gurnell, Frank, West End Farm, Ashby, Scunthorpe, Lincs.

- HALL, EDMOND, Torrisholme Hall, Morecambe (L.M.).
 Hall, Miss E. M. G., Craycombe House, Pershore, Worcester.
 Hall, R., Ferry, Bere Alston, South Devon.
 Hall, R. Charles, 1 & 2, Sloane Street, London, S.W. 1.
 Hall, Thomas, Marske Farm, Marske-by-the-Sea, Yorks.
 Hallett, C. M., Walronds Park, Ile Brewers, Taunton.
 Hambro, Sir Eric, K.B.E., Milton Abbey, Blandford.
 Hambro, H. C., The Hyde, Luton, Beds.
 Hamilton, Miss M. H., Coddington Court, Ledbury, Herefordshire.
 Hamilton and Brandon, The Duchess of, Hamilton Palace, Lanarkshire.
 Hamilton of Dalzell, Lord, Dalzell, Motherwell, Scotland.
 Hamlyn & Co., Ltd. (represented by G. W. French), 45, Coplestone Road, Peckham, London, S.E. 15.
 Hammond, John, School of Agriculture, Cambridge.
 Hampden, Viscount, The Hoo, Welwyn (Agent, Estate Office).
 Hampshire, Frank H., Ash Villa, Uppertong, Holmfirth, near Huddersfield.
 Hankey, Colonel Walter A. (L.M.).
 Hannent, F. Charles, Saltwood House, Hanworth Road, Hounslow.
 Hansen's Laboratory, Ltd. (represented by J. C. Moller), Astor House, Aldwych, London, W.C. 2.
 Hardcastle, G. W., Arthington, near Leeds.
 Hardcastle, Major H. M., Bradshaw Hall, Bolton-le-Moors, Lancs.
 Harding, C. H., Grittleton, Chippenham, Wilts.
 Harding, E. G., J.P., Foscoote, Grittleton, Chippenham, Wilts.
 Hardman, N., The Elms, Barton, Preston, Lancs.
 Hardy, Charles, Argos Hill, Rotherfield, Sussex.
 Hare, Lady Kathleen, Brokenhurst Park, Brockenhurst, Hants.
 Hare, C. W., Woodside, Stonelot Hill, Sutton, Surrey.
 Hare, G. F., Trafford Road, Wisbech, Cambs.
 Harewood, Earl of, Harewood House, Leeds, Yorks.
 Harford, M. W., Horton Hall, Horton, near Bristol.
 Hargreaves, Miss E., Nazeing Park, Essex, via Waltham Cross.
 Hargreaves, Miss L., Nazeing Park, Essex, via Waltham Cross.
 Hargreaves, Miss M., Nazeing Park, Essex, via Waltham Cross.
 Harlech, Lord, Brogyntyn, Oswestry.
 Harmsworth, V. G., Valley Holme, Horstead Keynes, Sussex.
 Harries, T. Ll., Pilrboth, Llangain, Carmarthen.
 Harris, C. and T. (Calne), Ltd. (represented by R. P. Redman), Calne, Wilts.
 Harris, R. R., Clapham Hill Poultry Farm, Whitstable, Kent.
 Harris, Stanley, Aspley Guise, S. O., Bedford (L.M.).
 Harris, W. J., The Ferns, Rogerstone, Mon.
 Harrison & Sons (represented by J. Harrison), St. James Street, Leicester.
 Harrison, McGregor & Co., Ltd. (represented by T. D. Harrison), Albion Iron Works, Leigh, Lancs.
 Harvey, D. G., Wooston Farm, Moretonhampstead, South Devon.
 Hasler & Co. (represented by W. Hasler), Dunmow, Essex.
 Hastings, Lord, Melton Constable Park, Norfolk.
 Hatchwell, Miss H. M., 38, Abbotsbury Road, Newton Abbot.
 Hatfield, E., Ministry of Agriculture and Fisheries, Welsh Office, Aberystwyth.
 Hawes, F., Little Compton, Moreton-in Marsh, Glos.
 Hawes, Miss G. B., Frenches Farm, Chipperfield, Herts.
 Hawes, W., Easington Farm, Long Crendon, Thame, Oxon.
 Hawkins, A. W. Bailey, The Garage, Whitwell, Welwyn.
 Haworth, Alfred, B.A., J.P., Ravelstone, Manley, Warrington.
 Hay, A., East Anglian Institute of Agriculture, Chelmsford.
 Hay, Percy T., 3, Brookfield Park, Highgate Road, London, N.W. 5.
 Hay, W. D., B.Sc., Somerset Farm Institute, Bridgwater, Somerset.
 Haydon, D., 63, Honor Oak Road, S.E. 23 (H.M.).
 Hayes, G. Constable, The Greenway, Shurdington, Cheltenham.

- Hayes-Sadler, Lt.-Col. J., White Coppice Poultry Farm, High Hurstwood Uckfield.
- Haylett, R. W., Railway Road, Downham, King's Lynn.
- Hayward, Colonel J. F. Curtis, Quedgeley, Gloucester (L.M.).
- Headly, L. C., Abbey Gate, Leicester.
- Heap, Miss I., Lilies, Aylesbury.
- Hearnshaw, Mrs. R. Fletcher, Foxhill, Burton Joyce, Nottingham (L.M.).
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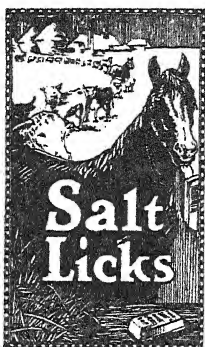
AND

CHEDDAR LOAF

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The British Dairy Farmers' Association does not accept responsibility for any statements made in the advertisement columns of this Journal.

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NATURAL ROCK SALT IODISED MINERAL LICKS

Made from carefully selected crystals of Natural Lump Rock Salt as mined by us showing 95% Salt.

All the virtues of the natural product retained and enhanced by the addition of LIME PHOSPHATES, IRON and IODINE essential for heavy milkers as well as development of young stock, cures and prevents mineral deficiency diseases.

PURE SALT LICKS made from the highest quality of Pure Vacuum Salt also supplied.

One free holder given with each order of one dozen Licks.
EXTRA HOLDERS SUPPLIED AT NOMINAL PRICES.



PURE VACUUM DAIRY SALT THE INCOMPARABLE DAIRY SALT

Manufactured from purified Cheshire Brine and free from Gypsum and Magnesium Chloride.

EVEN GRAIN.

QUICK SOLUBILITY.

(2 per cent. in 5 seconds.)

BACTERIA FREE.

Produces in Butter and Margarine Even Texture,
∴ Sound Flavour and Uniform Quality. ∴

Apply to your Local Merchant for particulars and leaflets or to

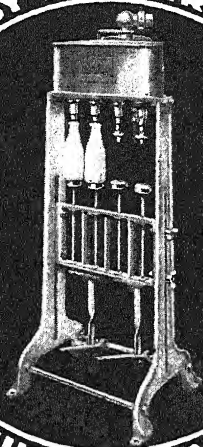
THE SALT UNION L^{TD.}
COLONIAL HOUSE, AND STOKE PRIOR,
LIVERPOOL, Nr. BROMSGROVE.

BRATBY MEASURING & FILLING MACHINES

EASY TO OPERATE

APPROVED
BY THE
BOARD
OF TRADE

CLEANED
IN A
FEW
MOMENTS



ACCURATE MEASURE

DESIGNED FOR USE IN THE SMALL DAIRY
Made in Three Sizes with 2, 4 and 6 Filling Heads

AUTOMATIC MACHINES ALSO MANUFACTURED
Write to-day for our brochure on—"AUTOMATIC BOTTLING PLANTS"

BRATBY & HINCHLIFFE LTD
DAIRY ENGINEERS.
SANDFORD ST, ANCOATS,
MANCHESTER.

IWERNE MINSTER HOME FARM

The Property of JAMES ISMAY.

PEDIGREE DAIRY SHORTHORN BULLS
PEDIGREE BERKSHIRE BOARS AND GILTS
BACON (Smoked) SIDES AND HALF-SIDES
SAUSAGES

RIPE FARMHOUSE CHEDDAR CHEESE (Cut)
CHEDDAR LOAF (TRUCKLE) CHEESE
CREAM CHEESE

SITTINGS—*Leghorn, Rhode Island Red, Light Sussex*
FROM PRIZE STRAINS

CHICKEN—Milk Fattened, Rough Plucked

WINDSCREEN, WATTLE and OSIER HURDLES
(Any Size made to Order)

ALL ON SALE

Apply :—ESTATE OFFICE, IWERNE MINSTER, BLANDFORD, DORSET.

ONTARIO, CANADA.

FARM LEARNERS and WOMEN HOUSE- HOLD WORKERS WANTED.

Free Passages are granted to Approved Boy Farm
Learners, over 15 and under 19 years of age.

SITUATIONS GUARANTEED.

Commencing Wages are about £2 a month, together
with board, lodging, washing and mending. After-
care by the Government of Ontario, for three years.

FREEHOLD FARMS can be purchased in Ontario at very reasonable
prices, on easy terms.

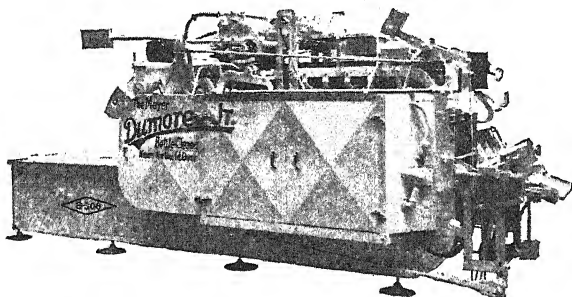
Information about Ontario free from—

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Branch Office—111, UNION STREET, GLASGOW.

THE
"Dumore Junior"
Automatic Bottle Washing and
Sterilizing Machine.



Capacity from 120-300 dozens per hour, with one Operator.

Guaranteed to produce 99·9 % clean, sterile bottles.

Also the "Dumore" for quantities up to 1,000 dozens
per hour.

Numerous repeat orders have been received—a sure
indication of the efficiency of the

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*Our claims vindicated by the Award of the Silver Medal at the
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GUERNSEYS

mean heavy milk yields,
high cream percentages,
and a contented and
satisfied Owner.

Get a few GUERNSEYS
and become an enthusiast.

GUERNSEYS FOR Milk, Cream, Butter

Learn more about this breed

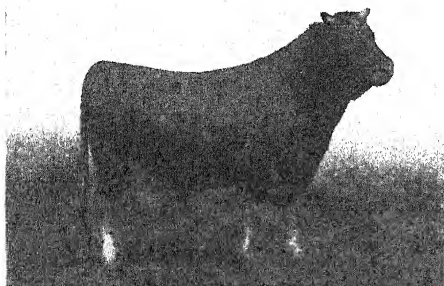
Illustrated pamphlet and full particulars from the SECRETARY
ENGLISH GUERNSEY CATTLE SOCIETY

12 HANOVER SQUARE, LONDON, W.1

The Norsebury Herd of Pedigree Guernseys

The Property of Mrs. J. SUTCLIFFE PYMAN
NORSEBURY, SUTTON SCOTNEY, HAMPSHIRE

Sequel and May Rose Blood



Senior Herd Sire, Sequel's Lodestar 2nd 4932

Sire—
SEQUEL'S LODESTAR 2287.
A.R. 19. Sire of
Froome's Flora 5th,
Champion R.A.S.E.,
1926, that gave milk
11840 lbs., 662'02 lbs.
B.F. with first calf.
Sire of 33 A.R.
daughters.

Sire—SEQUEL'S DELIGHT
2442 D.S.
A.R. (G.) 101. King's
Cup 1911.
Dam—3149 P.S.
FINANCIER'S HONORIA.
A.R. 69. 10907'75 lbs.
Milk, 532 lbs. B.F.

Dam—11529 D.S.
SEQUEL'S HONORIA 2nd.
A.R. 48. 11401 lbs.
Milk 532'66 lbs. B.F.
4'64'.

Sire—CLARA'S SEQUEL
2207 D.S.
A.R. (G.) King's Cup
1910.
Dam—4722 D.S.
SEQUEL'S HONORIA.
King's Cup 1913. A.R.
122. 12428 lbs. Milk.
540'64 lbs. B.F.

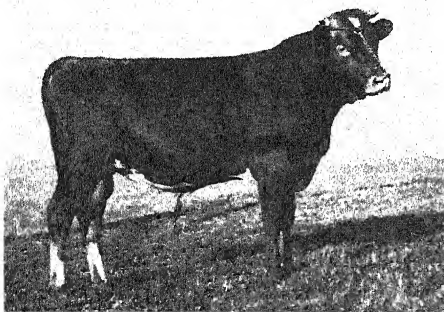


Photo by C. Hosegood.

Junior Sire, Norsebury Noel 6875

Sire—
WOODLANDS NOEL 3718.
Has 14 A.R. Cows
appearing in his pedi-
gree whose average
yield is 11848 lbs. Milk
and 563 lbs. B.F.

Sire—
CHEMUNANT'S SEQUEL
OF WOODLANDS 4723.

Dam—
FROOME'S FLORA 5TH
19718.
Qualified twice in
Advanced Register,
giving 11840'50 lbs.
milk, 662'02 lbs. B.F.,
5'10' with first calf,
1st Champion
R.A.S.E. Show, 1926.

Sire—ROSE LAD OF
GOODWINSTONE 3163.
A.R. 32. 1st Cham-
pion R.A.S.E. Show,
1913.

Dam—21839
ROSEY OF GOODWINSTONE
25TH. A.R. (Eng.)
2850. 7807'50 lbs. Milk.
424'46 lbs. B.F. 5'40'.
in 47 weeks with her
first calf.

Dam—12381
ROSEY OF GOODWINSTONE
27th. Qualified twice
in Advanced Register,
giving 8725'50 lbs.
milk, 439'76 lbs. B.F.,
5'04'.

PRIZES WON IN 1928

First Prize, Tunbridge Wells Show; Second Prize, Bath and West and
Southern Counties Show; Reserve, Royal Counties and R.A.S.E. Show.
London Dairy Show: 1st and 2nd Prize, Inspection "Reserve" Milking
Trials and V.H.C. Butter Tests

Inspection Invited. Young Stock for Sale out of A. R. Dams

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Telephone: Sutton Scotney 13
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MILK & CREAM CONTRACTORS.

NON-COMBINE BUYERS OF MILK AND CREAM.

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Telephone—DALSTON 0164.

Putnam's Dependable Veterinary Remedies.

FARMOLac DRENCH and LINIMENT.

The Combined Drench and Liniment. A Medicine that cures Garget, Chills, Colic, Milk Fever, Inflammation, and Udder-ill.

The Best Liniment for Sprains, Swellings, Harness Galls, Cuts, Broken Knees, Stiffness, &c. 4/-, Post Free.

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The Great Healer. Helps the Cows and helps the Milker. It soothes at a touch, and cures in 24 hours Hard Bag, Chapped and Sore Teats, Swollen Udders, and Garget. 3/-, 1-lb. Tin; 10/6, 4-lb. Tin; 18/-, 7-lb. Tin, Post Free.

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For Cows only. Strengthens and re-builds the hard-worked digestive and milk-producing organs. Is guaranteed to increase milk yield. Supplies all essential minerals in an economical form. Costs less than 1d. per day. 2/6, 25-dose Tin. 17/6, 200-dose Tin. 27/6, 350-dose Tin. Dose measure in each Tin. Post Free.

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The Certain Remedy. No Farmer can afford to experiment with "Hit or Miss" Remedies of a toxic nature. This Special Preparation was created to relieve the Stock owner of the anxiety and serious loss that often follows Husk or Hoose in Calves. 7/6 per Bottle, containing 60 doses, with dose measure. Post Free.

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Guaranteed to Reduce Feeding Costs: Pigs are earning units: To protect earning units is good business. It's easy to keep Pigs healthy, vigorous, and making fast, economical gains with Farmolac Pig Powders. It's Nature's tonic for tender stomachs. 1/9, 25 Powders. 12/6, 200 Powders. 21/-, 350 Powders. In Tins, with dose measure. Post Free.

OUR MONEY-BACK GUARANTEE OF SERVICE.

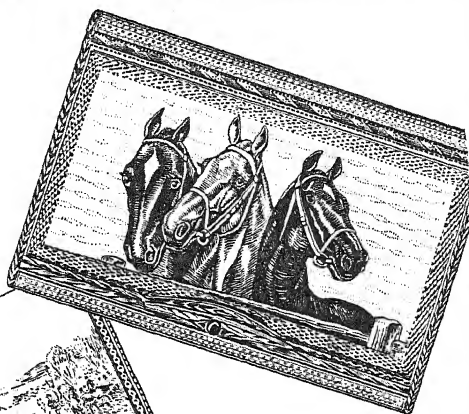
You take no risks in testing our Remedies—Our Money-Back Guarantee fully protects you—if you are not convinced that there is an improvement after three doses or applications, return the remainder with receipt and we will gladly refund your Money, and the postage you have paid.

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Northam,
North Devon.



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Sterling Silver Gilt and
Enamel Cigarette Case,
£7 2s. 6d.



Sterling Silver Gilt and Enamel
Cigarette Case, £9 15s. 0d.

*The Goldsmiths & Silversmiths
Company will be pleased to pre-
pare estimates on request.*

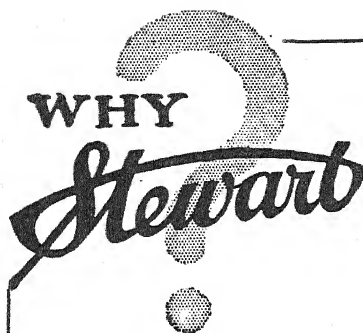
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Your favourite horse or dog can be re-
produced true-to-life in finely coloured
enamels on a Cigarette or Vanity case.
This work can be undertaken either from
photographs or drawings.

The GOLDSMITHS & SILVERSMITHS COMPANY LTD.

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NO BRANCH ESTABLISHMENTS ANYWHERE.



Because they are made of finest materials, are backed by 39 years' experience—will clip and shear fastest and last longest. No. 1 Clipper for hand use (£3 carriage forward). No. 10 Clipper for faster work (£3 10s. carriage forward). No. 9 Sheep Shearer (£4 5s. carriage forward) for hand use and power models.

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HORSE &
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AND SHEEP SHEARING MACHINES

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HARNESS COMPO AND BOOT POLISH,
HARNESS OIL,
METAL AND OTHER POLISHES,
DISINFECTANTS,
SHEEP DIP, CATTLE WASHES,
ANTISEPTIC SOAPS, OILS AND GREASES.

7/15, LAMB'S PASSAGE, LONDON, E.C. 1.

Prices and full particulars on application.



*Fine Presentation Bowl in
Sterling Silver, decorated with
flat chasing. 10 in. diam.
£42 : 0 : 0*

*End view of handle
to illustrate details
of chasing.*

Sterling Silver Cups and Bowls.

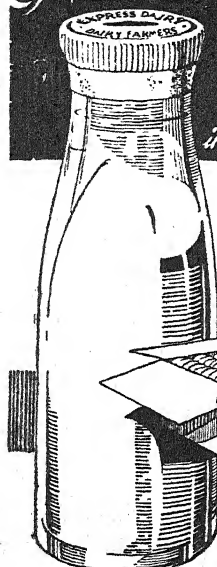
Mappin & Webb have the finest selection of
Sterling Silver Cups and Bowls in London
at prices ranging from 18s. 6d. to £250.

Solid and of substantial weight, strong and
simple in construction, the Cups and Bowls
embody in their design the best features of
both the modern and the old. Selections
will be sent for approval, or an illus-
trated catalogue forwarded upon request.

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LONDON.

Sealed in a Second



**NO MACHINERY.
NO ADHESIVE.
NO WIRE USED**

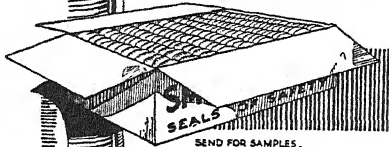
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SMITH'S "SEALS OF SAFETY"

are approved and passed by the
MINISTRY OF HEALTH
as for CERTIFIED and

GRADE "A" MILK

Largely used for Nursery and Special
Milk. Packed & Sealed in Dustproof Boxes.



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SEAMLESS CANS.

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The very thing for Grade A Milk.

At Rock Bottom Prices.

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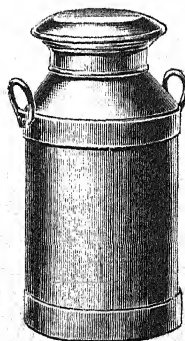
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AND
FINEST NATURAL FEED
IS
LODERS
PURE COCONUT CAKE

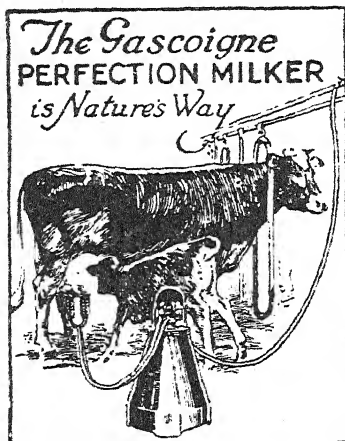
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The Gascoigne Milker.



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The Fastest Milker.

Mr. W. J. REAY, The Grange, Church Lawford, Rugby, milks 45 cows easily in an hour with four Units, some cows giving three gallons in three minutes.

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The low vacuum gives a big factor of safety against careless operators.

The Cheapest to Run.

Only $1\frac{1}{2}$ h.p. up to six Units.

Low Depreciation.

Mr. J. MURRAY ALLEN, Hooklands, Scaynes Hill, Haywards Heath, at his Farm Sale, realised £165 for his Six Unit Gascoigne Milker.

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Licensed Registry Departments.

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Trained Dairymaids,
Gardeners, and
Poultry Women.

Employers suited with above at
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For all particulars apply—

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MEMBERS will materially
assist the B. D. F. A. by
proposing new Members.

Full particulars of the
Association's activities and
application forms can be
obtained from—

The SECRETARY,
British Dairy Farmers'
Association,
28, Russell Square, London,
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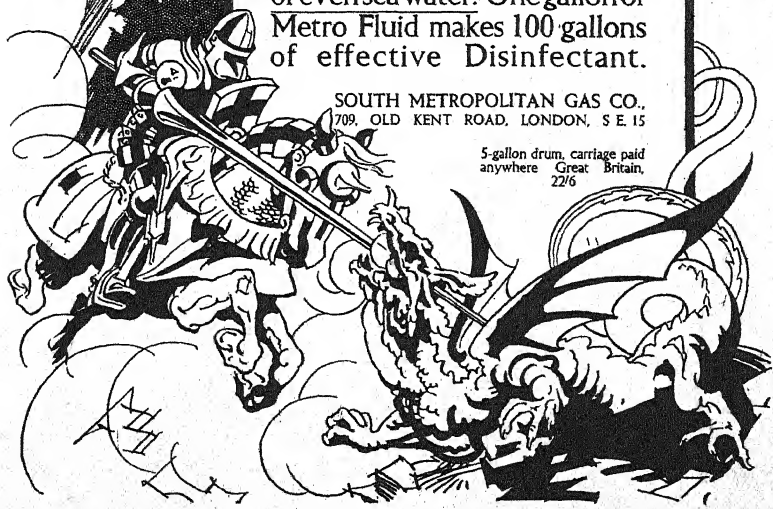
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METRO DISINFECTANT FLUID

A perfect Tar-acid Emulsion, guaranteed by the Rideal-Walker Test to be over four times more powerful than pure Carbolic Acid. The diluted fluid carries its full quota of destroying agent to the organism whether the water employed in mixing be hot, cold, hard, soft or even sea water. One gallon of Metro Fluid makes 100 gallons of effective Disinfectant.

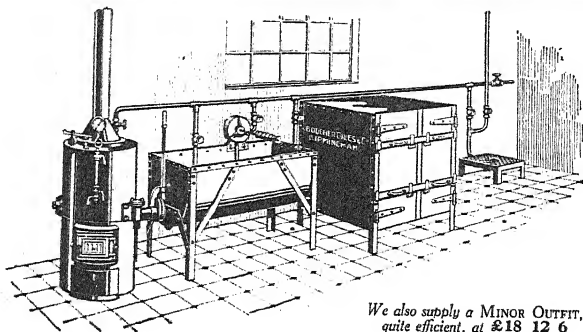
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5-gallon drum, carriage paid
anywhere Great Britain,
22/6

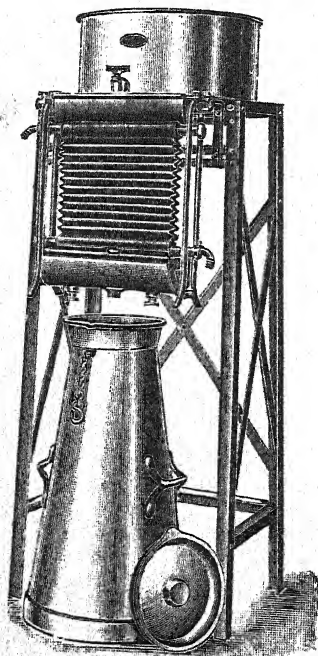


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For Producers of Clean Milk.



*We also supply a MINOR OUTFIT,
quite efficient, at £18 12 6
Please send for particulars.*



The strong serviceable Steam
"REFORM" (Regd.)

Sterilising Outfit

including 50-lbs. working pressure
Boiler and Galvanised Iron Cabinet
with Double Iron Doors.

The "REFORM"

PATENT (No. 294313)

Cooling Outfit

Comprising

A Cooler that can be readily cleaned.
A Milk Vessel that drains itself
through a patent hygienic tap.
A Galvanised Iron adjustable Stand.

Kindly send Card for List of our Dairy Equipment.

BOUCHER-GILES & CO.,

Dairy Engineers, &c..

113, 114, COLESHILL STREET,
BIRMINGHAM.

Duco's
DAIRY CROWN^{REGD}

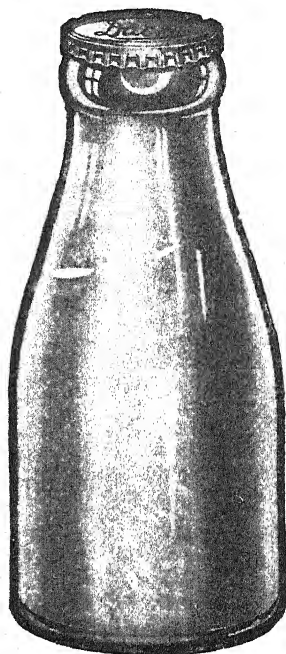
EVERY "AUTHORITY" APPROVES IT!

EVERY DAIRYMAN PREFERS IT
BECAUSE—

It is economical.
Easy to apply—
easy to remove, yet—
Fraudproof!

Makes the perfect seal
in the practical and
hygienic sense.

Conforms to all
regulations and is
preferred by the
public.



SEND TO-DAY FOR FULL DETAILS TO :—

THE CROWN CORK COMPANY
SOUTHALL. LTD.,

SALVET

The Genuine Iodised Mineral Lick.

WONDERFUL EFFECTS ON STOCK.

(Made under Royal Letters Patent No. 28412.)



FOOT AND MOUTH DISEASE TOTALLY BANISHED.

Containing Sodium, Calcium, Phosphorus, Iron and Iodine. The mineral content only found in young grass 2 months of the year.

Cows give 50 per cent. more milk. Young stock grows twice as fast. Saving in Food Bill 30 per cent.

WE GUARANTEE SALVET LICKS, OR MONEY RETURNED.

Price 14/- dozen Licks. Will fit any holder.

*DON'T PUT LOOSE MINERALS IN FEED.
IT IS BOTH DANGEROUS AND WASTEFUL.*

SALVET, LTD.,
HIGH STREET, WAVERTREE, LIVERPOOL.

ROYAL CREAM SEPARATORS

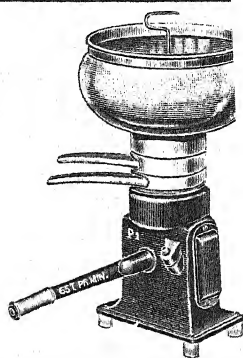
Sizes from 18 to 100 galls. per hour.

Separating made easy.

50 and 100 gallon Machines
being fitted with Ball Bearings.

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23, North Cross Road,
East Dulwich,
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Phone:
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Annual Subscription £1. Dairy Instructors, Students and full time Secretaries of Milk Recording Societies 10s. 6d.

Full particulars and application forms can be obtained from—

The SECRETARY, British Dairy Farmers' Association,
28, Russell Square, London, W.C. 1.

"FOUR OAKS"

Spraying, Limewashing & Disinfecting Machines



are absolutely ideal for EASILY, ECONOMICALLY
and EFFECTIVELY carrying out the provisions of

The New Milk & Dairies Order

which came into force October 1st, 1926.

Part VI, Clause 22, Section 2 of this Order provides that—"Every cowkeeper shall cause the ceiling or interior of the roof and the walls of every cowshed to be properly lime-washed or sprayed with lime or otherwise disinfected twice at least in every year, once during April or May, and once during September or October, and at such other times as may be necessary."

PENALTY FOR NON-COMPLIANCE WITH ORDER.

Any person not complying with the Order is liable on summary conviction to a fine of Five Pounds for first offence and Fifty Pounds for second and subsequent offence, and if the offence is a continuing one, to a further fine not exceeding Two Pounds for each day the offence continues.

WHY RUN ANY RISK WHEN THE ORDER CAN BE SO EASILY COMPLIED WITH BY USING A "FOUR OAKS" MACHINE?



Illustration shows "Wizard" Pattern
Limewashing a wall.

ADVANTAGES.—With a "Four Oaks" Machine, 500 square feet can be beautifully limewashed in ten minutes without splashing or inconvenience.

One coat applied with a machine on rough, uneven walls or surfaces, is equal to two coats applied with a brush.

Also, the material, being applied as a spray by a powerful pump, is driven into cracks and crevices where disease and insect pests breed, and where no brush could ever reach.

With a machine a man can do as much in half-an-hour as in a day with a brush.

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Ceilings and roofs very easily limewashed.

Machines are made in various sizes and patterns to suit all users:—

"Farmer" Pattern, 4 galls. - 62/6
"Farmer-de-Luxe," 4 galls. 68/-
"Dairyman," 6 galls. - 80/-
"Dairyman-de-Luxe," 6 galls. 85/6
"Wizard," 6 galls. (as *Illus.*) 99/6

"Victor," 6 galls. - £7/10/-
(On One wheel.)
"Little Giant," 12 galls. - £11/10/-
(On Two wheels.)
"Stafford," 18 galls. - £15/-/-
(On Two wheels.)

Complete Catalogue free on application to the **SOLE MANUFACTURERS** :

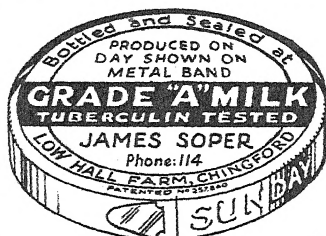
The Four Oaks Spraying Machine Co.,
Four Oaks Works, Sutton Coldfield, BIRMINGHAM.

Telegrams: "Sprayers, Four Oaks." Telephone: Sutton Coldfield 305.

"THAT SILVER MEDAL SEAL"

THE WALLIS SAFETY CAP.

APPROVED BY
THE MINISTRY
OF HEALTH.



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